

VOLUME 13

PART I

MEMOIRS

OF THE

QUEENSLAND MUSEUM

BRISBANE



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QUEENSLAND MUSEUM

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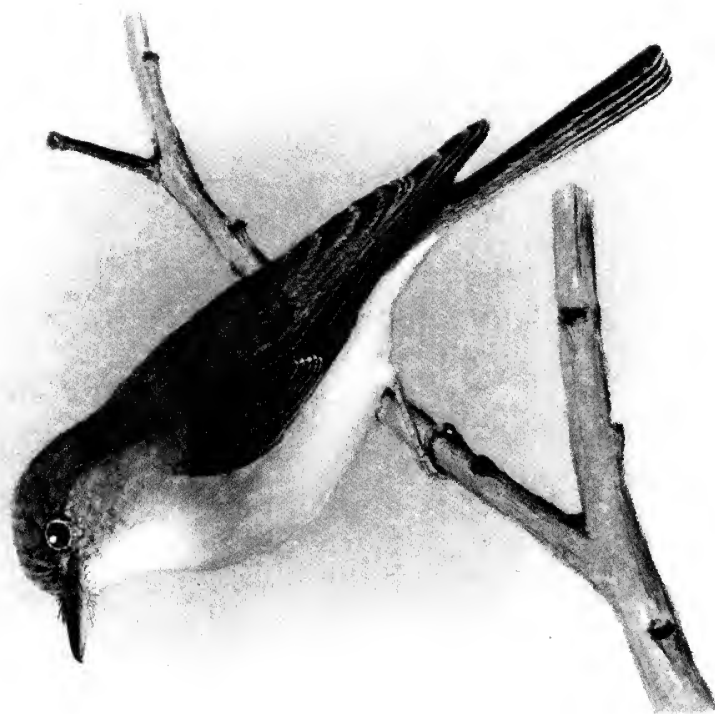


Plate I.

Left. *Microeca griseiceps* griseiceps De V.

Right. *Ardea fidesopitizinus* lorealis De V.

## BIRDS FROM CAPE YORK PENINSULA, QUEENSLAND.

GEORGE MACK.

Queensland Museum.

From 1933 to 1939, Mr. Richard Archbold's organisation (Archbold Expeditions), associated with the American Museum of Natural History, New York, made extensive biological collecting surveys in New Guinea. A number of expeditions performed valuable work in little-known areas, even making use of the airplane as a means of travel and transport.

It was not surprising therefore that this organisation sought and obtained permission from the Queensland authorities in 1948 to collect material during six months in Cape York Peninsula. The marked similarity in flora and fauna of this part of Australia and New Guinea has long been known, and the desire to round off the earlier work by collecting in northern Queensland was readily understood.

When the initial arrangements were being made I expressed the wish that a member of the Queensland Museum staff might accompany the party for a time to collect for the State Museum. Agreement on this was quickly reached when Mr. L. J. Brass, leader of the Archbold party, reached Australia. It was decided that Mr. D. P. Vernon, a senior Preparator of this Museum should join the party at Portland Road and remain in the field for two months. Instead, he collected for four months, continuing at the invitation of Mr. Brass until the field work was completed. Vernon commenced collecting at Portland Road on 29th May, 1948, and ceased operations at Mt. Finnegan, near Cooktown, on 27th September, 1948. In the main, he concentrated on birds, but gave some attention to mammals and reptiles, and even to those among the insects and other invertebrates that are readily obtained and suitably preserved in spirit.

He returned with 507 birds (20 spirit preserved), 135 mammals (48 spirit preserved), together with 34 reptiles and a series of invertebrates in spirit; a very fine single effort in the time available. The 507 birds represent 140 species; of these, 134 species (474 specimens) collected in eastern Cape York Peninsula from Portland Road in the north to the Cooktown district in the south are recorded in this paper. Material taken in eastern ports or at sea on the journey north to Portland Road is not included.

The area traversed with route and camps is shown on the map (Fig. 1). No collecting was done on the coast; work was carried out either in areas of tropical rain forest or in the more extensive savanna.

I wish to thank Mr. Brass and the Archbold organisation for the collecting facilities provided for the Queensland Museum.

#### THE AREA.

Cape York Peninsula is the most northerly portion of the State of Queensland. It is roughly triangular in shape, about 350 miles across at the base, with the apex at Cape York, 500 direct miles to the north. Although isolated from the rest of Queensland, in that there is, as yet, no rail and only indifferent road connections north of Cairns, Cape York Peninsula has for long been sparsely settled by Europeans. The cattle industry is probably the most stable development so far, but the search for economically valuable minerals, especially gold, has always attracted and held a limited population.

There is now a regular monthly service by ship to all ports; a bi-weekly air service from Cairns through Coen and Iron Range to Thursday Island, north-west of Cape York; and an air service from Normanton to the cattle stations on the west coast of the Peninsula.

Church mission stations, with which is associated the majority of the dwindling population of Aborigines, were first established in 1891. There are five on the west and four on the east coast. The combined acreage of these stations is between five and six million acres, individual allotments varying from 4,318 to 1,600,000 acres. The areas provide scope for cattle raising, and vegetables and fruits are generally produced by irrigation.

#### PHYSIOGRAPHIC AND ZOOGEOGRAPHIC NOTES.

As elsewhere in eastern Australia, the main physiographic feature is the discontinuous range, more or less parallel with the eastern coast and attaining to no great height, known as the Main Divide. Composed mainly of granites and basalts, with some older metamorphic and sedimentary rocks, this range is much closer to the eastern coast in Cape York Peninsula than it is elsewhere, and the relatively long drainage to the west is a notable feature. This western part of the Peninsula, comprising about three-fourths of the area, consists for the most part of Cretaceous sedimentary deposits except for a western coastal fringe of Pleistocene and Recent sediments.

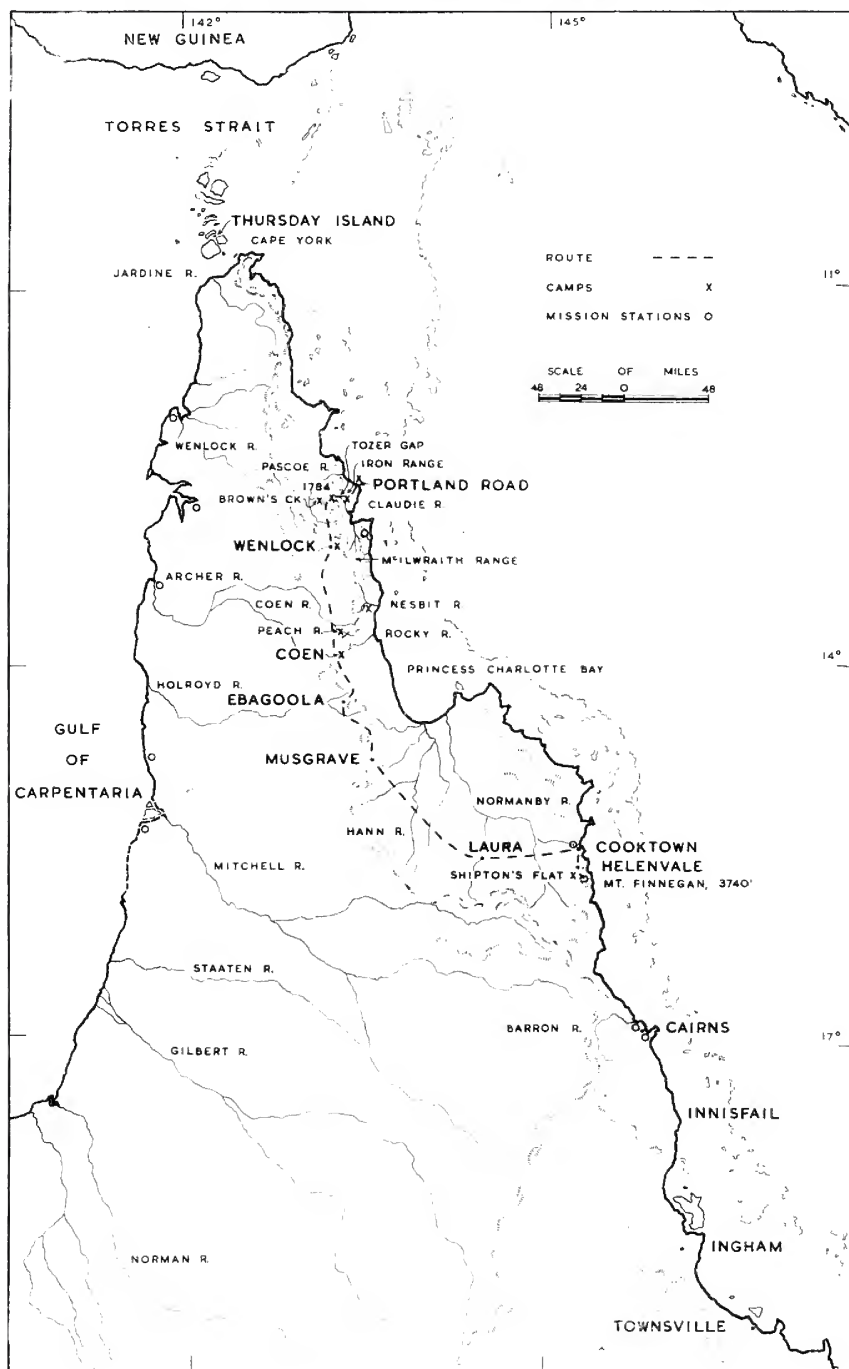


Figure 1.  
Cape York Peninsula, North Queensland.



Figure 2.

Face of rain forest at Iron Range, Cape York Peninsula, with wild bananas growing on the banks of a concealed stream. Altitude about 50 feet. Photo. by L. J. Brass, Archbold Cape York Expedition, June 22, 1948.

Although within the tropics and subject to monsoonal weather, by far the greater part is savanna and open forest. Tropical rain forest is limited to comparatively small areas on and east of the Divide, with restricted and poor rain forest associations along some of the rivers which flow to the west. Even on the east coast, there is a marked gap in the rain forest between the vicinity of Cooktown and that of Coen to the north, a distance of about 175 miles. This is clearly reflected in the distribution of the fauna, the progress of which in my view, has always been from north to south, and never in the reverse direction. A considerable number of species of birds and other animals are restricted to the rain forest north-east of Coen. Of the 134 species here recorded, 14 are confined in Australia to this area.





Figure 3.

Expedition party in open forest of box and ironbark trees on the Iron Range—Wenlock Road, Sir William Thompson Range (about 600 feet). Photo. by G. H. H. Tate, Archbold Cape York Expedition, July 24, 1948

Zoogeographically, Cape York Peninsula is part of the Torresian sub-region which embraces the northern coastal areas extending from north-western Australia to the east coast, and south to the vicinity of Sydney. The narrow eastern portion of the Peninsula, from the Main Divide to the coastal islands is part of the more northerly of two readily defined eastern provinces of this sub-region. The division between these two provinces is in the vicinity of Rockhampton, mid-east Queensland. The western portion of the Peninsula, from about the Jardine River south to the base of the Gulf of Carpentaria, constitutes another province. Some elements of the Eremian sub-region, which embraces the dry to arid interior, also are present in the savanna of the centre and west. The number of species is small, but these birds constitute a notable group.

## SOME PREVIOUS FIELD WORK.

It would appear that John MacGillivray, Naturalist aboard H. M. Survey Ship Rattlesnake, made the first recorded collection of birds from northern Cape York Peninsula. The material was obtained while surveying was in progress in the vicinity of Cape York. John Gould determined the birds and described some as new species, while MacGillivray (1852) published a complete list in his account of the voyage.

More than forty years later H. G. Barnard, a well-known Queensland field worker, collected in the vicinity of the Jardine brothers cattle property at Somerset, Cape York. Some of the material was recorded by Le Souef (1898) and the new form, *Talegallus purpureicollis*, was described.

Robinson and Laverock (1900) recorded a good series of specimens mainly from the Cooktown district, with some obtained near Cairns to the south. E. Olive was the collector, and some of his field notes were given in the published results. As far as I am aware, this was the first substantial record of birds from the Cooktown area.

In 1910, Barnard again was at Cape York collecting on behalf of H. L. White. In his field notes, Barnard (1911) added 14 species to the list of birds from northern Cape York Peninsula. About the same time, W. B. MacGillivray, a medical man of Broken Hill, New South Wales, was sailing in the northern waters of the Great Barrier Reef, landing on many of the islands and finally on the mainland at Claudie River. An account of this trip and a list of species observed were published by MacGillivray (1910). This was the first of a number of field trips, chiefly to the Claudie River area, carried out either in association with William McLennan as collector, or by the latter alone on behalf of MacGillivray (1914, 1917, 1918).

It was during this field work that McLennan collected for the first time in Australia the Red-cheeked Parrot (*Geoffroyus geoffroyi maclennani*), and the Red-sided Parrot (*Lorius roratus macgillivrayi*). McLennan was an excellent field-man and collector, who lived for many years in the Peninsula, and he was without peer as a maker of cabinet skins. It was always a pleasure to handle the material, now in the National Museum, Melbourne, which he collected in various localities in northern Australia for H. L. White.

His last work for H. L. White was carried out in the neighbourhood of Coen over a period of nine months in 1921-22. An excellent collection was obtained and recorded by White (1922), including the Golden-shouldered Parrot, *Psephotus chrysopterygius*, which is rare in collections.

The only list recorded between 1922 and the present was published by Thomson (1935).

All papers cited deal with birds observed or collected mainly in the area between Cooktown and Cape York, where the present material was obtained.



## ANNOTATED LIST OF SPECIMENS.

The letters (R. F.) associated with locality names indicate that the specimens were collected in or near rain forest. Owing to the restricted and broken nature of the rain forest, in some areas it is possible to pass from this type of country into savanna in a distance of a few yards. This results in some locality names covering both rain forest and savanna. Rain forest species recorded from Brown's Creek, Deep Creek and the Archer River, were collected in remnant patches of poor rain forest in the courses of these streams. At Shipton's Flat, near Cooktown, the only rain forest consists of similar remnants towards the base of Mt. Finnegan.

In discussing the distribution of some forms, reference is made to the " Cairns-Cardwell area." When collections are obtained in eastern Queensland between Cardwell and Rockhampton, a considerable number of rain forest species will doubtless be collected at least as far south as Townsville, and in some instances, south to Rockhampton. For the present, I am citing only the known distribution based on material already collected.

The sequence of species is, in the main, according to Wetmore (1951).

**CASUARIUS CASUARIUS JOHNSONII** Mueller. CASSOWARY.

*Casuarus johnsonii* F. Mueller, Australian, Dec. 15, 1866 (Gourie Creek, Queensland).

MATERIAL.—Iron Range (R.F.), one male.

The Cassowary is one of a number of species which are confined to the rain forest of Cape York Peninsula. Species in this category, especially those restricted to the country north of Coen, are sometimes loosely referred to as " New Guinea birds," and while it is highly probable that they were among the latest to enter Australia from New Guinea as the centre of radiation, the expression is none the less invalid. In general, distributional progress must be considered in terms of geological time. On land, this progress may for a time be impeded by barriers which arise, or assisted by the disappearance of barriers. For example, it is unlikely that the present extensive break in the rain forest between Coen and Cooktown existed when the Cassowary gradually made its way south to the rain forest in the Cairns-Cardwell area.

The species is now difficult to collect. Domestic pigs, liberated many years ago, and now living in great numbers in the wild state, would appear to be one of the main causes of the reduction in population. These mammals cause much destruction of ground habitat, and doubtless destroy the eggs and possibly the immature of this ground-dwelling and ground-nesting bird.

**PHALACROCORAX SULCIROSTRIS** (Brandt). LITTLE BLACK CORMORANT.

*Carbo sulcirostris* Brandt, Bull. Sci. Imp. Acad. Sci. St. Pétersb., 3, 1837, col. 56 (New South Wales).

MATERIAL.—Coen River, one male.

A wide-spread, but not an abundant species. There is no difference in material examined from widely separated localities.

**PHALACROCORAX MELANOLEUCOS MELANOLEUCOS** (Vieillot). LITTLE PIED CORMORANT.

*Hydrocorax melanoleucos* Vieillot, Nouv. Dict. Hist. Nat., 8, 1817, p. 88 (New South Wales).

MATERIAL.—Coen River, one male.

More numerous than *P. sulcirostris*, and equally widely distributed.

**NOTOPHOYX NOVAE-HOLLANDIAE** (Latham). WHITE-FACED HERON.

*Ardea novae Hollandiae* Latham, Ind. Orn., 2, 1790, p. 701 (New South Wales).

MATERIAL.—Wenlock, one male.

The White-faced Heron is another widely distributed species. Specimens occur singly except when breeding.

**CARPHEIBIS SPINICOLLIS** (Jameson). STRAW-NECKED IBIS.

*Ibis spinicollis* Jameson, Edinb. New Philos. Journ., 19, 1835, p. 213 (Murray River, New South Wales).

MATERIAL.—Wenlock, one male ; Archer River, one female.

The Straw-necked Ibis usually moves about in flocks, large and small. Its habit of feeding upon insect pests of pastures has gained it many friends. However, the habit is not peculiar to this Ibis, but the birds are large and readily noticed and tend to receive most of the credit.

**ACCIPITER NOVAE-HOLLANDIAE NOVAE-HOLLANDIAE** (Gmelin). WHITE (GREY) GOSHAWK.

*Falco novae-hollandiae* Gmelin, Syst. Nat., 1, pt. 1, 1788, p. 264 (New South Wales).

MATERIAL.—Portland Road, one female ; Iron Range, one female.

It was in Cape York Peninsula that H. G. Barnard proved that the white and grey goshawks are colour phases of the same species. Barnard collected a grey male and white female at one nest, and a grey female and white male at another.

It has yet to be satisfactorily shown that more than one subspecies of this goshawk occurs in Australia.

**ACCIPITER FASCIATUS FASCIATUS** (Vigors & Horsfield). BROWN GOSHAWK.

*Astur Fasciatus* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 181 (New South Wales).

MATERIAL.—Portland Road, one male, one female ; Iron Range, one male.

Owing to the marked change which takes place in the colour and pattern of the plumage of this goshawk, and the restricted nature of collections, subspecific differentiation must remain doubtful.

**HALIASTUR SPHENURUS SPHENURUS** (Vieillot). WHISTLING EAGLE.

*Milvus sphenurus* Vieillot, Nouv. Dict. Hist. Nat., 20, 1818, p. 364 (New South Wales).

MATERIAL.—Peach River, one male ; Wenlock, two females.

For the present, it is well to refer Australian representatives to one subspecies.

**MILVUS MIGRANS AFFINIS** Gould. FORK-TAILED KITE.

*Milvus affinis* Gould, Syn. Bds. Austr., pt. 3, 1838, pl. (New South Wales).

MATERIAL.—Ccen River, one male ; Iron Range, one female.

Primarily a species of the inland of Australia, the Fork-tailed Kite on occasions of severe and lengthy droughts in the inland and north, is one of the few species which moves towards coastal areas. This movement recently took place in 1951 when flocks of up to 500 of these Kites were present in eastern Queensland and elsewhere.

**IERACIDEA BERIGORA BERIGORA** (Vigors & Horsfield). BROWN HAWK.

*Falco Berigora* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 184 (New South Wales).

MATERIAL.—Pascoe River, one male ; Wenlock, one male, one female.

Wing measurements of the three specimens are as follows:—female 350, male 310, male 298. Condon (1951) dealt with this difficult species, with the exception of Queensland birds. It may be that the present specimens should be referred to *centralia*.

**FALCO CENCHROIDES CENCHROIDES** Vigors & Horsfield. KESTREL.

*Falco Cenchroides* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 183 (New South Wales).

MATERIAL.—Coen, one female.

Despite considerable variation in colouration, it has not been possible to recognise more than one subspecies for Australia.

**MEGAPODIUS FREYCINET ASSIMILIS** Masters. SCRUB FOWL.

? *Megapodius assimilis* Masters, Proc. Linn. Soc. New South Wales, 1, 1876, p. 59 (Dungeness Island and Bet Island, Torres Strait).

MATERIAL.—Iron Range (R.F.), three males, one female, one (?); Upper Parrot Creek, Mt. Finnegan (R.F.), one male, one (?).

There would appear to be two races of this mound-builder in Australia, one in Arnhem Land (*M. f. t mulus*), and the other in Cape York Peninsula ranging south on the east coast to Rockhampton. The correct name for the latter form is doubtful.

*M. reinwardt yorki* was described by Mathews (1929) with Cedar Bay, Cooktown, as the type locality. More recently *M.f. castanotus* was provided (Mayr, 1938) for the birds from the Cairns district, when it was remarked that Mathew's Cooktown material agreed with northern Peninsula specimens, but was distinct from the Cairns district birds. This is unusual. The rain forest is continuous from Cairns to Cooktown, but between Cooktown and about the latitude of Coen to the north, the country is mainly savanna and open forest. Where two races of a species occur on the east coast of Cape York Peninsula, usually there is a break in the range between Cooktown and Coen, but not between Cooktown and Cairns.

There is no difference in the seven specimens recorded here from Iron Range in the north and Mt. Finnegan near Cooktown in the south. In the circumstances, I prefer to use Master's name until more material is available.

**ALECTURA LATHAMI PURPUREICOLLIS (Le Souef). BRUSH TURKEY.**

*Talegallus purpureicollis* Le Souef, Ibis, 1898, p. 51 (Cape York Peninsula, Queensland).

MATERIAL.—Iron Range (R.F.), two males; Brown's Creek (R.F.), one male; Deep Creek (R.F.), one male.

A feature of this subspecies is the red colour of the wattles on the lower part of the neck. These wattles are yellow in *A. l. lathamii*.

**LOBIBYX MILES (Boddaert). MASKED PLOVER.**

*Tringa miles* Boddaert, Table Pl. enlum., 1783, p. 51 (Timor Laut).

MATERIAL.—Musgrave Station, one male, one female.

Similar in habits to the well-known Spur-winged Plover (*L. novae-hollandiae*) which occurs to the south, the Masked Plover readily takes wing making its strident call on the approach of human beings. It does not range south of Rockhampton on the east coast although recorded in the Checklist (1926) as occurring south to Brisbane.

**MEGALOPREPIA MAGNIFICA ASSIMILIS (Gould). WOMPOO PIGEON.**

*Carpophaga assimilis* Gould, Jardine's Contr. Orn., 1850, p. 106 (Cape York, Queensland).

MATERIAL.—Iron Range (R.F.), one female; Mt. Finnegan (R.F.), one female, one (?).

There is a marked difference in size between this smaller form of the Peninsula and the larger *M. m. magnifica* to the south.

**MACROPYGIA PHASIANELLA ROBINSONI Mathews. BROWN PIGEON.**

*Macropygia phasianella robinsoni* Mathews, Nov. Zool. 18, 1912, p. 185 (Northern Territory).

MATERIAL.—Iron Range (R.F.), two males, one female, one (?); Tozer Gap (R.F.), two males.

Assuming that the type is a male, Mathews statement that this form "Differs from *M. p. phasianella* in its much smaller size and its paler colouration especially on the head," is correct. He gave the type locality as the "Northern Territory," and later, apparently without explanation, he altered this to "Alexandra, Northern Territory."

The Brown Pigeon is a bird of the rain forest, and I doubt if it occurs in any part of the Northern Territory, least of all in the arid country of Alexandra Station south of the Gulf of Carpentaria.

The birds from the rain forest of Cape York Peninsula are smaller and lighter in colouration than a series of *M. p. phasianella* from south-east Queensland.

**GEOPELIA STRIATA TRANQUILLA Gould. PEACEFUL DOVE.**

*Geopelia tranquilla* Gould, Proc. Zool. Soc. London, 1844, p. 56 (Liverpool Plains, New South Wales).

MATERIAL.—Coen, one male.

Although only one example of this well-known form was taken, it is obviously to be referred to the larger *G. s. tranquilla* of the eastern coastal areas. Peters (1937) included Cape York Peninsula within the range of the smaller *G. s. placida* of the north and north-west.

**GEOPELIA CUNEATA CUNEATA (Latham). DIAMOND DOVE.**

*Columba cuneata* Latham, Index Orn., Suppl., 1801, p. lxi (Sydney, New South Wales).

MATERIAL.—Portland Road, one male, one female.

This is another widely distributed species. The two specimens collected do not differ from material obtained much farther south on the east coast.

**GEOPELIA HUMERALIS HUMERALIS (Temminck). BAR-SHOULDERED DOVE.**

*Columba humeralis* Temminck, Trans. Linn. Soc. London, 13, pt. 1, 1821, p. 128 (Broad Sound, Queensland).

MATERIAL.—Portland Road, two males; Tozer Gap, one male, one female; Brown's Creek, one male; Shipton's Flat, one male, one female.

A tropical and subtropical form of the coastal areas, the Bar-shouldered Dove is not uncommon in Cape York Peninsula.

**CHALCOPHAPS INDICA CHRYSOCHLORA (Wagler). GREEN-WINGED PIGEON.**

*Columba chrysochlora* Wagler, Syst. Av., 1827, *Columba*, sp. 79 (Gosford, New South Wales).

MATERIAL.—Iron Range (R.F.), one male, one female; Archer River (R.F.), one male; Shipton's Flat (R.F.), one male.

A rain forest species; generally disturbed while on the ground.

**TRICHOGLOSSUS HAEMATOD SEPTRENTIONALIS Robinson. RAINBOW LORIKEET.**

*Trichoglossus novahollandiae* subsp. *septentrionalis* Robinson, Bull. Liverpool Mus., 2, 1900, p. 115 (Cooktown, Queensland).

**MATERIAL.**—Portland Road, two males; Iron Range, one male, one female; Brown's Creek, two males, one female; Wenlock, one male; Peach River, one male.

Compared with *moluccanus*, this subspecies is smaller in size and brighter in colouration. The head especially is a deeper blue and is not tinged grey as in *moluccanus*.

The range is north-eastern Queensland, south to Rockhampton.

**PSITTEUTELES VERSICOLOR VERSICOLOR (Lear). VARIED LORIKEET.**

*Trichoglossus versicolor* Lear, Illustr. Psittac., pt. 7, 1831 (Cape York, Queensland).

**MATERIAL.**—Hann River, two males, one female, one (?).

Both the Varied and the Rainbow Lorikeet are nomadic but not migratory in habit. The flowering of the Australian eucalypts is an erratic process, and the movements of these nectar-feeding parrots follow the same pattern.

These four Peninsula specimens are markedly darker than a large series of specimens from the Northern Territory. Mathews' *mellori* (1912) from the Northern Territory was described as differing from Cape York Peninsula specimens in being darker, especially on the head, cheeks and breast. In the series available, the direct opposite of Mathews' statement is found to be the case.

**PROBOSCIGER ATERRIMUS ATERRIMUS (Gmelin). PALM COCKATOO.**

*Psittacus aterrimus* Gmelin, Syst. Nat., 1, pt. 1, 1788, p. 330 (Northern Australia).

**MATERIAL.**—Iron Range (R.F.), three females; Tozer's Gap (R.F.), one male, one female; Brown's Creek (R.F.), one female.

This is one of a number of species which are confined to the rain forest, north-east of Coen in Australia.

**CALYPTORHYNCHUS MAGNIFICUS MAGNIFICUS (Shaw). RED-TAILED BLACK COCKATOO.**

*Psittacus magnificus* Shaw, Nat. Misc., 2, 1790, pl. 50 and text (New South Wales).

**MATERIAL.**—Shipton's Flat, one male, two females.

The distribution of this species in eastern Australia is unusual, and it is apparent that Peters (1937) found difficulty in outlining the ranges of the subspecies.



The species is present in Cape York Peninsula, south to Cardwell. Apparently it does not occur in coastal areas immediately to the south of Cardwell, and it is not present in south-east Queensland, where both *C. funereus* and *C. lathamii* have been collected near to the coast. With the exception of western Victoria, it would appear to be absent from south-eastern Australia, and it is not present in the islands of Bass Strait or Tasmania where *C. funereus* occurs.

*C. lathamii* is the main species of inland south-eastern Australia, overlapping *C. magnificus* in the south and extending to Kangaroo Island. In the north, it is fairly numerous on the coastal range of south-eastern Queensland, and has been taken with *C. funereus* near to the coast in this area. The northern and southern extensions of range in this species are exceptional.

*C. baudinii* alone is present in extreme south-western Australia, but elsewhere in that State in suitable localities, and in the Northern Territory and Central Australia, *C. magnificus* alone occurs.

**KAKATOE GALERITA subspecies. WHITE COCKATOO.**

*Psittacus galeritus* Latham, Ind. Orn., 1, 1790, p. 109 (New South Wales).

MATERIAL.—Portland Road, one male; Iron Range, one male.

Although fairly common and widely distributed, it is unlikely that there is sufficient material of the species in any collection to permit differentiation of subspecies in Australia.

**KAKATOE ROSEICAPILLA (Vieillot). GALAH.**

*Cacatua roseicapilla* Vieillot, Nouv. Dict. Hist. Nat., 17, 1817, p. 12 (New South Wales).

MATERIAL.—Iron Range, one female.

This is one of the forms that is more commonly found in the arid inland. The specimen was taken in the open country beside rain forest in the Iron Range district.

**LORIUS RORATUS MACGILLIVRAYI (Mathews). RED-SIDED PARROT.**

*Eclectus pectoralis macgillivrayi* Mathews, Austr. Av. Rec., 2, 1913, p. 75 (Pascove River, North Queensland).

MATERIAL.—North Claudie River (R.F.), one male; Iron Range (R.F.), one male.

The Red-sided and Red-cheeked Parrots were first collected in Australia by McLennan. Both are confined to the rain forest north-east of Coen.

**GEOFFROYUS GEOFFROYI MACLENNANI (Macgillivray). RED-CHEEKED PARROT.**

*Pseudopsittacus maclennani* MacGillivray, Emu, 13, 1913, p. 105 (Pascove River, Queensland).

MATERIAL.—Iron Range (R.F.), one male, one female; Peach River (R.F.), one imm. male.

The Peach River specimen is immature and lacks the red cheeks, lores, and forehead, and the blue head and nape of the adult male. The head and nape are dull reddish-brown, faintly tinged blue, and the forehead, lores and cheeks are olive-green except for a spot of red in front of each eye.

**APROSMICTUS ERYTHROPTERUS COCCINEOPTERUS** (Gould). RED-WINGED PARROT.

*Ptilines coccineopterus* Gould, Handb. Bds. Austr., 2, 1865, p. 39 (Port Essington, Northern Territory).

MATERIAL.—Archer River, one male; Coen River, two males, one female.

These specimens from the Peninsula and a few from the Northern Territory are slightly paler in colouration than others from more southern localities, but a larger series is required. There would appear to be no difference in size; the four Cape York Peninsula specimens vary from 190 to 195 mm. in wing length. Meantime, Gould's *coccineopterus* is retained.

**ALISTERUS SCAPULARIS MINOR** Mathews. KING PARROT.

*Alisterus cyanopygius minor* Mathews, Nov. Zool., 18, 1911, p. 23 (Cairns, Queensland).

MATERIAL.—Mt. Finnegan (2,600 feet), one female.

The material available, including the single specimen from Mt. Finnegan, support the recognition of *minor* as a northern subspecies of smaller size.

**PLATYCERCUS ADSCITUS ADSCITUS** (Latham). PALE-HEADED ROSELLA.

*Psittacus adscitus* Latham, Ind. Orn., 1, 1790, p. 126 (Cooktown, Queensland).

MATERIAL.—Wenlock, two males, one (?).

There are two subspecies of the Pale-headed Rosella; *P. a. adscitus* ranges from Cape York south to the vicinity of Rockhampton, and *P. a. palliceps* is present in south-eastern Queensland and northern New South Wales.

Specimens of *palliceps* are larger, the cheeks are white or almost white, and generally a greater portion of the fore-part of the body is yellow. *P. a. adscitus* is smaller, the cheeks are almost entirely blue, and less of the fore-part of the body is yellow.

**CACOMANTIS PYRROPHANUS PRIONURUS** (Lichtenstein). FAN-TAILED CUCKOO.

*Cuculus prionurus* "Ill." Lichtenstein, Verz. Doubl. Zool. Mus. Berlin, 1823, p. 9 (New South Wales).

MATERIAL.—Brown's Creek, one female; Archer River, one female.

Both specimens are birds of the year. They were collected in July, 1948. The breeding range is eastern and southern Australia.



**CHALCITES MALAYANUS RUSSATUS** (Gould). RUFOUS-BREASTED BRONZE CUCKOO.

*Chrysococcyx russatus* Gould, Proc. Zool. Soc. London, 1868, p. 76 (Cape York district, Queensland).

MATERIAL.—Archer River, one male.

This form is readily distinguished from *C. m. minutillus* of north-western Australia and the Northern Territory. In the latter, the upper surface and the barring of the under surface are green; in *russatus* these parts are russet or even rufous in colour.

**CENTROPUS PHASIANINUS PHASIANINUS** (Latham). PHEASANT COUCAL.

*Cuculus phasianinus* Latham, Index. Orn., Suppl., 1801, p. xxx (New South Wales).

MATERIAL.—Coen, one male; Shipton's Flat, one male.

The Pheasant Coucal is not uncommon in the open and cleared country of eastern Queensland.

**NINOX NOVAESEELANDIAE OCELLATA** (Bonaparte). BOOBOOK OWL.

*Athene ocellata* Bonaparte, Cons. Av., 1, 1850, p. 42 (Raffles Bay, Coburg Peninsula, Northern Territory).

MATERIAL.—Iron Range, one female; Brown's Creek, one male; Archer River, one male; Coen River, one (?); Hann River, one female.

This is the small light-coloured form of the northern coastal areas, collected in open savanna. The darkest form of all (*N. n. lurida*) occurs in the rain forest in the vicinity of Cairns and Cardwell.

**PODARGUS STRIGOIDES MARMORATUS** Gould. FROGMOUTH.

*Podargus marmoratus* Gould, Bds. Austr., Suppl., pt. 2, 1855, pl. 8 (Cape York Peninsula).

MATERIAL.—Wenlock, two males; Brown's Creek, one (?); Archer River, one male; Coen, one male, two females.

To decide upon the number of species of the genus *Podargus* in Australia always has been difficult. Wide variation in colour and in size gave rise in the early years to the description of many new species. Some have been readily consigned to synonymy, but there has been a not unreasonable tendency to retain as species the three forms described by John Gould (*P. phalaenoides*, *P. plumiferus*, and *P. marmoratus*), in addition to *P. strigoides* and *P. papuanus*.

For some time now it has been generally agreed that *phalaenoides* is a small sized subspecies of *strigoides* from north-western Australia and Arnhem Land. I have already indicated (Peters, 1940) that *P. plumiferus* is based on nothing more than a colour variation of *strigoides*. After a close examination of the seven specimens collected by Vernon in northern Cape York Peninsula, together with other material in the collections of this Museum, I have no doubt that *P. marmoratus* Gould also is a subspecies of *strigoides*. *P. s. marmoratus* is small in size and in this respect is close to *P. s. phalaenoides*. This no doubt explains why a number of observers have recorded *phalaenoides* from Cape York Peninsula.

**PODARGUS PAPUENSIS** Quoy & Gaimard. PAPUAN FROGMOUTH.

*Podargus papuensis* Quoy and Gaimard, Voy. "Astrolabe," Zool., 1, 1830, p. 207; Atlas, Ois., pl. 13 (Manokwari Harbour, New Guinea).

MATERIAL.—Portland Road, one male; Brown's Creek, one male.

This frogmouth is almost twice the size of *P. s. marmoratus*. It is confined to the country north of Coen.

**EUROSTOPODUS GUTTATUS GUTTATUS** (Vigors & Horsfield). SPOTTED NIGHTJAR.

*Caprimulgus guttatus* Vigors and Horsfield, Trans. Linn. Soc. London, 15, pt. 1, 1826, p. 192 (New South Wales).

MATERIAL.—Portland Road, one female.

The collecting of nightjars is greatly a matter of chance, and as a result, collections are not representative. From the material which I have seen over a number of years, it would seem that *guttatus* is a form of the dry to arid interior of Australia, ranging from west of the eastern coastal range to the mid-west coast. It is one of the few inland forms which occur in Cape York Peninsula.

On the other hand, *Eurostopodus albo-gularis* is a coastal form, ranging in eastern Australia from the Cairns-Cardwell area south and west to South Australia.

It should be noted that Mathews has designated Parramatta, New South Wales as the type locality of *guttatus*.

**CAPRIMULGUS MACRURUS YORKI** Mathews. LARGE-TAILED NIGHTJAR.

*Caprimulgus macrurus yorki* Mathews, Nov. Zool., 18, 1912, p. 291 (Cape York, Queensland).

MATERIAL.—Portland Road, one (?); Iron Range, three males; Tozer Gap, one male.

The broadly white-tipped outer tail feathers are a notable field character of this species.

**COLLOCALIA SPODIOPYGIA TERRAE-REGINAE** (Ramsay). GREY SWIFTLET.

*Cypselus terrae-reginae* Ramsay, Proc. Zool. Soc. London, 1874 (1875), p. 601 (near Cardwell, Queensland).

MATERIAL.—Iron Range, one male; Brown's Creek, one (?); Shipton's Flat, one male.

I have followed Mayr (1937) in his arrangement of this difficult group.

**CEYX AZUREUS PULCHER** (Gould). AZURE KINGFISHER.

*Alcyon pulchra* Gould, Proc. Zool. Soc. London, pt. 14, 1846, p. 19 (Port Essington, Northern Territory).

MATERIAL.—Brown's Creek, one male.

Although only one specimen was obtained, I have no doubt that it is an example of the form described by Gould from Port Essington. Mathews *mixta* is a synonym of *pulcher*.

**HALCYON TOROTORO FLAVIROSTRIS** Gould. YELLOW-BILLED KINGFISHER.

*Halcyon (Syma ?) flavirostris* Gould, Jardine's Contr. Orn., 1850, p. 105 (Cape York, North Queensland).

MATERIAL.—North Claudie River, one male.

*H. t. flavirostris* is one of the forms confined to the Peninsula, north-east of Coen.

**DACELO NOVAEGUINEAE MINOR** Robinson. KOOKABURRA.

*Dacelo gigas minor* Robinson, Bull. Liverpool Mus., 2, 1900, p. 116 (Cooktown, Queensland).

MATERIAL.—Wenlock, one male.

This is the smaller sized form named by Robinson from Cape York Peninsula.

That the name *novaequinae* 1783 has priority over *gigas* 1783 was first brought to notice by Stressemann (1920). As this kingfisher does not occur in New Guinea, it should be possible to have the name suppressed in favour of *gigas*.

**DACELO LEACHI CERVINA** Gould. BLUE-WINGED KOOKABURRA.

*Dacelo cervina* Gould Bds. Austr. and adj. Ids., pt. 2, 1838, pl. 2 (Port Essington, Northern Territory).

MATERIAL.—Coen River, one female.

The single specimen is clearly to be referred to *cervina*.

**HALCYON MACLEAYI MACLEAYI** Jardine & Selby. FOREST KINGFISHER.

*Halcyon Macleayi* Jardine and Selby, Illustr. Orn., 2 (1903), pl. 101 and text (Port Essington, Northern Territory).

MATERIAL.—Portland Road, one male; Tozer Gap, one male, one female; Shipton's Flat, one male, one female.

There is a fairly general northward movement of this species after breeding. It is unlikely that more than one subspecies is present, at least in the east.

**HALCYON SANCTA SANCTA** Vigors & Horsfield. SACRED KINGFISHER.

*Halcyon sanctus* Vigors and Horsfield, Trans. Linn. Soc. London, 15, pt. 1, 1827, p. 206 (New South Wales).

MATERIAL.—Portland Road, one male, one female; Brown's Creek, one male.

The Sacred Kingfisher also moves northward after breeding. Only one subspecies appears to be present in eastern Australia.

**MEROPS ORNATUS** Latham. RAINBOW-BIRD.

*Merops ornatus* Latham, Index Orn., Suppl., 1801, p. xxxv (New South Wales).

MATERIAL.—Portland Road, two males, one (?); Iron Range, one male, one female.

The northward movement in the preceding two Kingfishers and in *M. ornatus* is never complete. Individuals are present throughout the winter months in areas south of Cape York Peninsula.

**PITTA VERSICOLOR SIMILLIMA** Gould. NOISY PITTA.

*Pitta simillima* Gould, Proc. Zool. Soc. London, 1868, p. 76 (Cape York, North Queensland).

MATERIAL.—Iron Range (R.F.), one female; Rossville Creek (R.F.), one male; Upper Parrot Creek, Mt. Finnegan (R.F.), one male.

*P. v. simillima* is decidedly smaller in all dimensions compared with the only other Australian subspecies, *P. v. versicolor*, which ranges south from Rockhampton to north-eastern New South Wales.

**CORACINA NOVAE-HOLLANDIAE MELANOPS** (Latham). BLACK-FACED CUCKOO-SHRIKE.

*Corvus melanops* Latham, Index. Orn. Suppl., 1801, p. 24 (Sydney, New South Wales).

MATERIAL.—Iron Range, two males, one female.

This species also moves north after breeding, but again the movement is not complete. Unless the individual birds return to the same breeding areas after each partial migration, it is difficult to see how subspecific differences can be developed and maintained.

The three specimens from Iron Range do not differ from others obtained at Gympie, south-east Queensland and Roper River, Northern Territory.

**CORACINA PAPUENSIS STALKERI** Mathews. WHITE-BREASTED CUCKOO-SHRIKE.

*Coracina hypoleuca stalkerii* Mathews, Nov. Zool. 18, 1912, p. 327 (Cooktown, North Queensland).

MATERIAL.—Portland Road, one male, one (?); Brown's Creek, one male; Peach River, one female; Shipton's Flat, one male, one female.

The grey colour of the breast in mature specimens does appear to be characteristic of this subspecies.

**EDOLISOMA TENUIROSTRE TENUIROSTRE** (Jardine). JARDINE CATERPILLAR EATER.

*Graucalus tenuirostris* Jardine, Edinburgh Journ. Nat. Geog., 3, 1831, p. 211 (New South Wales).

MATERIAL.—Peach River, one male.

This is an uncommon form in eastern Australia.

**LALAGE SUEURII TRICOLOR (Swainson). WHITE-WINGED TRILLER.**

*Cebblepyris tricolor* Swainson, Zool. Journ., 1, 1825, p. 467 (Sydney, New South Wales).

**MATERIAL.**—Portland Road, one female ; Brown's Creek, one female.

This species too moves northward after the breeding season and apparently some specimens reach south-eastern New Guinea.

**LALAGE LEUCOMELA LEUCOMELA (Vigors & Horsfield). VARIED TRILLER.**

*Campephaga leucomela* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 215 (Broad Sd., mid-east Queensland).

**MATERIAL.**—Portland road, one male, one (?); North Claudie River, two males, one female ; Archer River, one male ; Peach River, one (?).

A more common form in Cape York Peninsula than *L. s. tricolor*.

**DICRURUS BRACTEATUS BRACTEATUS Gould. SPANGLED DRONGO.**

*Dicrurus bracteatus* Gould, Proc. Zool. Soc. London, 1842, p. 132, 1843 (Queensland).

**MATERIAL.**—Brown's Creek (R.F.), one female.

This is another form which moves northward in the winter months and returns southward again in the spring. The movement is not complete.

**ORIOULUS SAGITTATUS SAGITTATUS (Latham). OLIVE-BACKED ORIOLE.**

*Coracias sagittata* Latham, Index Orn. Suppl., 1801, p. 26 (Sydney, New South Wales).

**MATERIAL.**—Portland Road, two males ; Shipton's Flat, one male ; Upper Parrot Creek, Mt. Finnegan, one male.

Two subspecies of this oriole occur in Australia ; *sagittatus* in the east and south-east, and *affinis* in the north-west and Northern Territory.

**ORIOULUS FLAVOCINCTUS KINGI Mathews. YELLOW ORIOLE.**

*Oriolus flavocinctus kingi* Mathews, Nov. Zool., 18, 1912, p. 435 (Cairns, North Queensland).

**MATERIAL.**—Portland Road, one male ; North Claudie River, one male ; Archer River, one male ; Peach River, one male, one (?); Shipton's Flat, two males.

Again, two subspecies are present in Australia ; *flavocinctus* in the north-west and Northern Territory and *kingi* in Cape York Peninsula, south to the Cairns-Cardwell area.

**CORVUS CORONOIDES subspecies. CROW.**

*Corvus coronoides* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 261 (Parramatta, New South Wales).

**MATERIAL.**—Brown's Creek, one female ; Wenlock, one male.

I have long held the view that there are only two species of *Corvus* in Australia ; *C. bennetti* in the interior and *C. coronoides* and subspecies throughout Australia. The body feathers of specimens of the latter species from the south-east, south, and probably the south-west have dark grey bases. This colour gradually changes through lighter grey to white in specimens from the centre and north. This character combined with size will doubtless provide means for subspecific differentiation when collections become sufficiently comprehensive.

The bases of body feathers in the two examples recorded are white, and in all respects these birds agree with others available from the Roper River, Northern Territory and Cooper's Creek, western Queensland.

**STREPERA GRACULINA MAGNIROSTRIS** White. PIED CURRAWONG.

*Strepera graculina magnirostris* White, Emu, 22, 1923, p. 258 (Coen, North Queensland).

MATERIAL.—Wenlock, one male.

This is the large-sized subspecies described by White from Coen. The bill especially is notable ; the culmen in the present specimen measures 70 mm.

**CRACTICUS QUOYI SPALDINGI** Ramsay. BLACK BUTCHER-BIRD.

*Cracticus spaldingi* Ramsay, Proc. Linn. Soc. N.S.W., 2, 1878, p. 211 (Darwin, Northern Territory).

MATERIAL.—Archer River (R.F.), one female ; Upper Nesbit River (R.F.), one female ; Upper Parrot Creek, Mt. Finnegan (R.F.), one female.

Three Australian forms of this species, based on size, have been accepted. However, size would seem to be a variable factor.

The three examples recorded are black. The first two are similar in all respects to black birds from the Cairns-Cardwell area, while the Mt. Finnegan specimen is smaller and agrees in dimensions with the brown birds from the Cairns-Cardwell area. Although no material from the northern Territory is at present available for comparison, it is unlikely that there is more than one subspecies in Australia.

**CRACTICUS MENTALIS KEMPI** Mathews. BLACK-BACKED BUTCHER-BIRD.

*Cracticus mentalis kempi* Mathews, Aust. Av. Rec., 1, 1912, p. 95 (Cape York, North Queensland).

MATERIAL.—Wenlock, one female.

This species is confined to the country north of Coen in Australia. Specimens from this area are distinctly smaller than New Guinea examples.

**GRALLINA CYANOLEUCA** (Latham). MAGPIE-LARK.

*Corvus cyanoleucus* Latham, Index Orn. Suppl., 1801, p. 25 (New South Wales).

MATERIAL.—Iron Range, one (?) ; Wenlock, one male.



A wide-spread and well-known form. Sufficient material is not available to permit consideration of subspecies. In collections examined to date, no subspecific difference has been noted.

**AILUROEDUS MELANOTIS MACULOSUS Ramsay. SPOTTED CATBIRD.**

*Aeluroedus maculosus* Ramsay, Proc. Zool. Soc. London, 1874, p. 601, 1875 (Rockingham Bay, North Queensland).

**MATERIAL.**—Iron Range (R.F.), one female ; Rocky Scrub (R.F.), one male ; Mt. Finnegan (R.F.), four males, two (?).

There would appear to be one subspecies of the Spotted Catbird in Australia. It ranges, in rain forest only, from Cape York south to the Cairns-Cardwell area. Mathews' *A. m. fairfaxi* has no standing, nor has *A. m. joanae* which he described as recently as 1941 (Mathews, 1941). The latter is based on a single specimen in the Queensland Museum collected by Neuhäuser in the Rocky Scrub district. This locality to Mathews became "Cape York" which is over 200 miles distant from the Rocky Scrub. The type and only specimen is slightly smaller than average, and the same can be said of occasional examples from other localities.

Although *A. crassirostris* (Paykull) and *A. melanotis* (Gray) in my view are clearly separate species, Mayr (1941) has listed them as one species.

**SCENOPOEETES DENTIROSTRIS Ramsay. TOOTH-BILLED BOWER-BIRD.**

*Scenopoeus dentirostris* Ramsay, Proc. Zool. Soc. London, 1875, p. 591, 1876 (vicinity Bellenden-Ker Range, North-east Queensland).

**MATERIAL.**—Mt. Finnegan (R.F.), one male.

This specimen from Mt. Finnegan, near Cooktown, extends the range of the species northward from the Cairns-Cardwell area.

**CHLAMYDERA CERVINIVENTRIS Gould. FAWN-BREASTED BOWER-BIRD.**

*Chlamydera cerviniventris* Gould, Jardine's Contr. Orn., 1850, p. 106 (Cape York, North Queensland).

**MATERIAL.**—Tozer Gap, one male.

*Chlamydera cerviniventris* is a rare form in collections. Apparently it has not been recorded south of the Claudie River district in Australia.

**CHLAMYDERA NUCHALIS ORIENTALIS Gould. GREAT BOWER-BIRD.**

*Chlamydera orientalis* Gould, Ann. Mag. Nat. Hist., 4, 1879, p. 74 (North Queensland).

**MATERIAL.**—Wenlock, one male ; Shipton's Flat, one male.

The species was described from a single specimen which lacked a locality and other particulars. Later, Gould recorded specimens of both sexes from north-western Australia. Later still, the same author described a new species, *C. orientalis*, from the vicinity of Port Denison, north-east Queensland, when he particularly remarked upon the difficulty of recording the differences between it and *nuchalis*. These differences are accepted to-day as of subspecific value.

Mathews has stated that he compared specimens with the illustration of *nuchalis* provided by Jardine and Selby and concluded that the bird described by these authors must have come from north Queensland. If correct, this would make *orientalis* a synonym of *nuchalis*. The original description by Jardine and Selby is not available to me.

However, birds of the species from Cape York Peninsula do differ subspecifically from specimens obtained in north-western Australia and the Northern Territory, and for the present, I prefer to accept Gould's decision on the matter.

**CRASPEDOPHORA MAGNIFICA CLAUDIA Mathews. MAGNIFICENT RIFLE-BIRD.**

*Craspedophora magnifica claudia* Mathews, Austr. Av. Rec., 3, 1917, p. 72 (Claudie River, North Queensland).

MATERIAL.—Tozer Gap (R.F.), one female; Upper Nesbit River (R.F.), two males; Peach River (R.F.), one female.

The birds from the Rocky Scrub of the Upper Nesbit River and Peach River, 16 miles north-east of Coen, extend the range of this form south from the Claudie River district. This is probably the southern limit of distribution. It has already been noted that to the south, beyond Coen, there is a break in the rain forest of more than one hundred miles to the vicinity of Cooktown; here *P. victoriæ* occurs.

**PTILORIS VICTORIAE Gould. VICTORIA RIFLE-BIRD.**

*Ptiloris victoriæ* Gould, Proc. Zool. Soc. London, 1849, p. 111, 1850 (Barnard Isles, North Queensland).

MATERIAL.—Upper Parrot Creek, Mt. Finnegan (R.F.), one female.

This record of *P. victoriæ* from Mt. Finnegan, about 30 miles south of Cooktown extends the range of the species northwards from the Cairns-Cardwell area. This is likely to prove the northern limit of distribution.

**PHONYGAMMUS KERAUDRENI GOULDI (Gray). MANUCODE.**

*Manucodia gouldi* Gray, Proc. Zool. Soc. London, 1859, p. 158 (Cape York, North Queensland)

MATERIAL.—Tozer Gap (R.F.), one female.

The Claudie River district appears to be the southern limit of distribution of the Manucode.



**NEOSITTA STRIATA (Gould). STRIATED SITELLA.**

*Sitella striata* Gould, Bds. Austr., Suppl., 1869, p. 54 (Cape York, North Queensland).

MATERIAL.—Hann River, three males.

This is a Cape York Peninsula species, and records south of about Cardwell are considered doubtful.

Australian forms of the genus *Neositta* are in need of revision. For example, *N. albata* (Ramsay) is based on a female or young example of *N. striata*, and *N. leucocephala* (Gould) is obviously a subspecies of *N. chrysoptera* (Latham). It may be that with sufficient material *N. pileata* (Gould) and *N. leucoptera* (Gould) will prove to be conspecific. At least three, possibly four, species should be admitted. In this, I differ from Mayr (1950) and McGill (1948).

**SPHECOTHERES FLAVIVENTRIS Gould. YELLOW FIGBIRD.**

*Sphecotheres flaviventris* Gould, Proc. Zool. Soc. London, 1849, p. 111, 1850 (Cape York, North Queensland).

MATERIAL.—Peach River, one male ; Shipton's Flat, one male.

Cape York Peninsula south to the vicinity of Cardwell, in or near rain forest, is the range of the species in Queensland. A subspecies has been named from Arnhem Land, but it requires confirmation.

**ORTHONYX SPALDINGI Ramsay. NORTHERN LOG-RUNNER.**

*Orthonyx spaldingi* Ramsay, Proc. Zool. Soc. London, 1868, p. 386 (Rockingham Bay, North Queensland).

MATERIAL.—Mt. Finnegan (R.F.), three males, two females.

Some years ago (Mack, 1934) I suggested that this species probably ranged from Cardwell north to about Cooktown. The present specimens appear to be the first of the species recorded from north of Cairns.

**DRYMODES SUPERCILIARIS SUPERCILIARIS Gould. NORTHERN SCRUB-ROBIN.**

*Drymodes superciliaris* Gould, Jardine's Contr. Orn., 1850, p. 105 (Cape York, North Queensland).

MATERIAL.—Tozer Gap, one male.

It would appear that this form has not been collected south of the Claudie River district, and not noted south of Coen, in Queensland.

*D. s. colcloughi*, named from the Roper River, Northern Territory, is a good subspecies. The upper surface is much more rufous, and the under surface is white with rufous flanks, not wholly "reddish-brown" as described by Mathews.

**POMATOSTOMUS TEMPORALIS TEMPORALIS** Vigors & Horsfield. GREY-CROWNED BABBLER.

*Pomatorhinus temporalis* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 330 (Shoalwater Bay, Queensland).

MATERIAL.—Wenlock, one male (juv.).

There appears to be two forms of this babbler in eastern Australia, *temporalis* in the north and *trivirgatus* to the south of Rockhampton. At least two other subspecies can be readily recognised. *P. t. rubeculus* from the north-west, Northern Territory and central areas, and *P. t. nigrescens* from the mid-west.

**GERYGONE OLIVACEA FLAVIGASTA** (Diggles). WHITE-THROATED WARBLER.

*Acanthiza flavigasta* Diggles, Trans. Phil. Soc. Qld., 1876, p. 11 (Normanton, North Queensland).

MATERIAL.—Coen River, one male.

The Cape York Peninsula form of this species is smaller and much brighter in colouration than *olivacea*.

**GERYGONE PALPEBROSA PERSONATA** Gould. BLACK-THROATED WARBLER.

*Gerygone personata* Gould, Proc. Zool. Soc. London, 1866, p. 217 (Cape York, North Queensland).

MATERIAL.—Brown's Creek (R.F.), one female, one (?); Archer River (R.F.), one male; Rocky Scrub (R.F.), one male; Peach River (R.F.), one in spirit.

This is the only subspecies of the Black-throated Warbler in Australia. It is present in or near rain forest from Cape York south to near Rockhampton.

*G. flavida* Ramsay has been maintained by some authors as a separate species because the males are said to lack the black gular stripes present in males of *G. p. personata*. It is possible that the males of *personata* may breed before assuming full plumage.

**GERYGONE IGATA MASTERSI** (Sharpe). BROWN-WARBLER.

*Pseudogerygone mastersi* Sharpe, Cat. Bds. Brit. Mus., 1879, 4, p. 224 (Gulf of Carpentaria, North Queensland).

MATERIAL.—Brown's Creek, one (?); Mt. Finnegan, one (?).

Of all Australian genera of small passerine birds, *Gerygone* is most in need of revision. Meise (1931) dealt with the genus as a whole, but my conclusions (unpublished) on Australian forms differ considerably from those reached by Meise.

I consider that five species should be admitted for Australia, against eleven recognised in the Checklist (1926). *G. richmondi* is a synonym of *igata*, and both *cantatrix* and *tenebrosa* are subspecies of *magnirostris*. *G. mouki* is a synonym of *G. i. mastersi*, which with *levigaster* and *fusca* are subspecies of *igata*, and *G. flavida* is a synonym of *personata*, or at most, a subspecies of *palpebrosa*. The names of the five species which I admit are—*G. olivacea*, *G. palpebrosa*, *G. magnirostris*, *G. chloronota* and *G. igata*.

**ACANTHIZA PUSILLA KATHERINA** De Vis. BROWN THORNBILL.

*Acanthiza katherina* De Vis, Ann. Qld. Mus., 6, 1905, p. 43 (Bellenden Ker Range, North Queensland).

MATERIAL.—Mt. Finnegan, one male.

The presence of this form at Mt. Finnegan extends the known range northwards from the Cairns-Cardwell area. This is the northern limit of the genus in Australia.

**SERICORNIS BECCARII MINIMUS** Gould. SCRUB-WREN.

*Sericornis minimus* Gould, Bds. New Guinea, 3, 1875, p. 7 (Cape York, North Queensland).

MATERIAL.—Tozer Gap, one male; Rocky Scrub, two males, two males (?), one in spirit; Coen River, one in spirit.

For the purpose of recording *minimus*, I am following Mayr (1937) and including it as a subspecies of *beccarii*. Only the specimen from Tozer Gap, a male, is close to the characteristic clear-cut plumage pattern of the adult *minimus*. The remainder, from the Rocky Scrub district, are more rufous in colouration, especially on the under surface, and altogether the plumage pattern is indefinite. This lack of a distinct pattern is characteristic of the immature in other forms of the genus. Mayr has described similar specimens as a new subspecies, *S. b. dubius*, but I consider that these examples represent an immature stage of *minimus*.

*Sericornis* in Australia is another genus that is badly in need of revision. Eight species are listed in the Checklist (1926), but I doubt if any more than three should be admitted. *S. tyrannulus* De Vis is not a *Sericornis*, and I am inclined to the view that *laevigaster*, *minimus*, *maculatus*, and *humilis* are geographical representatives of *frontalis*. However, it is doubtful if all the material in Australian Museums is sufficient to permit a satisfactory revision.

Mathews (1941) described a new subspecies, *Sericornis magnirostris capensis*, from a single specimen in the Queensland Museum collected by Neuhäuser in the Rocky Scrub, Cape York Peninsula. The type is a specimen of *minimus* in the same state of plumage as those recorded above from the Rocky Scrub district.

**SERICORNIS LATHAMI CAIRNSI** Mathews. YELLOW-THROATED SCRUB-WREN.

*Sericornis lathamii cairnsi* Mathews, Nov. Zool., 18, 1912, p. 354 (Cairns, North Queensland).

MATERIAL.—Mt. Finnegan (R.F.), three males, one (?).

These specimens represent the northern and more richly coloured of two subspecies. Mt. Finnegan can be accepted as the northern limit of range of the species; the specimens are the first obtained from north of Cairns.

**SERICORNIS MAGNIROSTRIS VIRIDIOR** Mathews. LARGE-BILLED SCRUB-WREN.

*Sericornis magnirostris viridior* Mathews, Nov. Zool., 18, 1912, p. 355 (Cairns, North Queensland).

MATERIAL.—Mt. Finnegan (R.F.), two males, one male (?); Upper Parrot Creek, Mt. Finnegan (R.F.), one male.

The specimens recorded extend the range of the species northwards from Cairns to about Cooktown, and as with a number of other species, this would appear to be the northern limit. *S. m. viridior* is distinctly greenish above compared with olive-brown in the only other subspecies to the south of Rockhampton.

**MALURUS AMABILIS AMABILIS** Gould. LOVELY WREN.

*Malurus amabilis* Gould, Proc. Zool. Soc. London, 1850, p. 277, 1852 (Cape York, North Queensland).

MATERIAL.—Claudie River, one male ; Tozer Gap, one male, one female.

The male and female from Tozer Gap are in adult plumage, while the male from Claudie River is in course of changing from immature plumage to that of the adult male.

**MALURUS AMABILIS CLARUS** Mack. LOVELY WREN.

*Malurus amabilis clarus* Mack, Mem. Nat. Mus., 8, 1934, p. 114 (Cardwell, North-east Queensland).

MATERIAL.—Shipton's Flat, one male.

The markedly lighter blue of the head, ear-coverts and back shown by this single example from the vicinity of Cooktown is characteristic of this subspecies.

**MALURUS MELANOCEPHALUS PYRRHONOTUS** Mathews. RED-BACKED WREN.

*Malurus melanocephalus pyrrhonotus* Mathews, Nov. Zool., 1912, 18, p. 362 (Cairns, North Queensland).

MATERIAL.—Portland Road, one male.

The first indications of change to adult plumage is shown by this single specimen.

**RHIPIDURA FULIGINOSA PHASIANA** De Vis. GREY FANTAIL.

*Rhipidura phasiana* De Vis, Proc. Roy. Soc. Qld., 1, 1884, p. 156 (Norman River, North Queensland).

MATERIAL.—Tozer Gap, one female ; Brown's Creek, one male ; Peach River, one female (?) ; Mt. Finnegan, one male, one female ; Shipton's Flat, one in spirit.

A widely distributed species with about six rather ill-defined Australian subspecies. The greater extent of buff colour on the under surface appears to be a feature of *phasiana*.

**RHIPIDURA RUFIFRONS RUFIFRONS** (Latham). RUFOUS FANTAIL.

*Muscipapa rufifrons* Latham, Ind. Orn. Suppl., 1801, p. 50 (Sydney, New South Wales).

MATERIAL.—Nth Claudie River, one male ; Claudie River, one female ; Tozer Gap, one male ; Upper Nesbit River, two males ; Shipton's Flat, one male.

The Rufous Fantail moves north during the southern winter and returns south in the spring and early summer when it breeds. *R. r. rufifrons* is the subspecies of eastern Australia, and *R. r. dryas* in the north-west and Northern Territory.

**RHIPIDURA RUFIVENTRIS ISURA** Gould. NORTHERN FANTAIL.

*Rhipidura isura* Gould, Proc. Zool. Soc. London, 1840, p. 174, 1841 (Port Essington, Northern Territory).

MATERIAL.—Iron Range, one male ; Shipton's Flat, two males ; Upper Parrot Creek, Mt. Finnegan, one female ; Helenvale, one female.

Ranging in coastal areas from the Fitzroy River in the north-west to about Cardwell in eastern Australia, *isura* appears to be the only Australian form.

**RHIPIDURA LEUCOPHRYS PICATA** Gould. PIED FANTAIL.

*Rhipidura picata* Gould, Bds. Austr., 1848, Introd., p. xxxix (Port Essington, Northern Territory).

MATERIAL.—Coen River, one (?).

I have never been able to recognise more than two Australian subspecies of this well-known bird ; the smaller *picata* in the north, and *leucophrys* elsewhere.

**MYIAGRA RUBECULA RUBECULA** (Latham). LEADEN FLYCATCHER.

*Todus rubeculus* Latham, Ind. Orn. Suppl., 1801, p. 32 (Sydney, New South Wales).

MATERIAL.—Tozer Gap, one (?); Brown's Creek, one male, one female ; Annie River, one male ; Peach River, one male, one female ; Shipton's Flat, one female ; Helenvale, one in spirit.

The Leaden Flycatcher is another of the species which make an incomplete north and south movement annually in eastern Australia. *M. r. concinna* of the northern coastal areas is the only other subspecies.

**MACHAERIRHYNCHUS FLAVIVENTER FLAVIVENTER** Gould. BOAT-BILLED FLY-CATCHER.

*Machaerirhynchus flaviventer* Gould, Bds. of Austr. Suppl., 1851, p. 21 (Cape York, North Queensland).

MATERIAL.—Iron Range (R.F.), one male (?); Tozer Gap (R.F.), one male ; Rocky Scrub (R.F.), two males ; Upper Parrot Creek, Mt. Finnegan (R.F.), one male.

*M. f. flaviventer* is one of the many species confined to the rain forest of Cape York Peninsula, south to the vicinity of Cardwell.

**ARSES KAUPI** Gould. PIED FLYCATCHER.

*Arses kaupi* Gould, Bds. of Austr. Suppl., 1851, p. 19 (Cairns, North Queensland).

MATERIAL.—Shipton's Flat (R.F.), one female ; Upper Parrot Creek, Mt. Finnegan (R.F.), one male.

*A. kaupi* has not previously been recorded outside the Cairns-Cardwell rain forest area. These two specimens from the country about 30 miles south of Cooktown mark the northern limit of the range of the species.

**ARSES TELESCOPHTHALMUS LOREALIS De Vis.** FRILL-NECKED FLYCATCHER.

*Arses lorealis* De Vis, Proc. Linn. Soc. New South Wales, 10, 1895, p. 171 (Cape York, North Queensland).

MATERIAL.—Tozer Gap (R.F.), one male, one female; Peach River (R.F.), two males.

Owing to the want of sufficient comparative material, in an earlier note (Mack, 1931) I doubtfully retained *lorealis* as a species. Queensland material, however, is clearly to be referred to *telescopthalmus*, and it may be that *lorealis* will not stand. Australian birds are very close to *A. t. aruensis* and they may have to be referred to this subspecies.

In Australia, this flycatcher is confined to the rain forest north of Coen.

**PIEZORHYNCHUS ALECTO NITIDUS Gould.** SHINING FLYCATCHER.

*Piezorhynchus nitidus* Gould, Proc. Zool. Soc. London, 1840, p. 171, 1841 (Port Essington, Northern Territory).

MATERIAL.—Peach River (R.F.), one female; Rocky Scrub (R.F.), one male.

There is a tendency at present to refer back to the genus *Monarcha* some Australian species of flycatchers. This is all to the good in some instances, but I prefer to retain *Piezorhynchus* for the present species. The marked difference in plumage between the sexes is sufficient reason for maintaining a convenient subdivision.

**MONARCHA MELANOPSIS MELANOPSIS (Vieillot).** BLACK-FACED FLYCATCHER.

*Muscicapa melanopsis* Vieillot, Nouv. Diet., 21, 1818, p. 450 (Sydney, New South Wales).

MATERIAL.—Shipton's Flat, one male.

This is a migratory form in eastern Australia, and *melanopsis* is the only subspecies present.

**MONARCHA TRIVIRGATA ALBIVENTRIS Gould.** SPECTACLED FLYCATCHER.

*Monarcha albiventris* Gould, Proc. Zool. Soc. London, 1866, p. 217 (Cape York, North Queensland).

MATERIAL.—Portland Road (R.F.), one imm.; Nth Claudie River (R.F.), one male, one (?); Iron Range (R.F.), one imm. male; Tozer Gap (R.F.), one male, two imm., one in spirit; Peach River (R.F.), one in spirit; Upper Nesbit River (R.F.), one female; Rocky Scrub (R.F.), one (?).



The two Australian subspecies of the Spectacled Flycatcher are readily recognised when in adult plumage. In *albiventris*, the lower under surface is wholly white and there is a greater extent of white in the distal part of the tail; in *gouldi*, the flanks are rufous, and the extent of white on the distal part of the tail is less.

The species occurs in or on the margins of rain forest. *M. t. albiventris* ranges from Cape York to the vicinity of Coen, and *M. t. gouldi* from Cooktown to northern New South Wales.

**MONARCHA TRIVIRGATA GOULDI Gray. SPECTACLED FLYCATCHER.**

*Monarcha gouldi* Gray, Proc. Zool. Soc. London, 1860, p. 352 (New South Wales).

MATERIAL.—Shipton's Flat (R.F.), one male, one imm., one (?); Upper Parrot Creek, Mt. Finnegan (R.F.), one male.

Remarks on this subspecies are given under *M. t. albiventris*.

**MONARCHA LEUCOTIS Gould. WHITE-EARED FLYCATCHER.**

*Monarcha leucotis* Gould, Jardine's Contr. Orn., 1850, p. 105 (Cape York, North Queensland).

MATERIAL.—Tozer Gap, one (?).

This is an uncommon species. Only a single damaged specimen was obtained at Tozer Gap by Vernon. Its range seems to be from Cape York to south-east Queensland; it does not occur outside this coastal area.

**MICROECA FLAVIGASTER TERRAEREGINAE Mathews. LEMON-BREASTED FLYCATCHER.**

*Microeca flavigaster terraereginae* Mathews, Nov. Zool., 18, 1912, p. 303 (Cairns, North Queensland).

MATERIAL.—Iron Range, one male, two females; Nth. Claudie River, one male.

Cape York Peninsula south to the vicinity of Cardwell is the range of this form. *M. f. flavigaster*, the only other Australian subspecies, occurs in the north-west and Northern Territory.

**MICROECA GRISEOCEPS GRISEOCEPS De Vis. YELLOW FLYCATCHER.**

PLATE I.

*Microeca griseiceps* De Vis, Ann. Rep. Brit. New Guinea 1893-4, p. 101, 1894 (Mt. Manaëao, South-east New Guinea).

MATERIAL.—Tozer Gap (R.F.), one (?).

This is Mathews' *Kempiella kempi*. The specimen from Tozer Gap is only the second Australian collected example which I have seen. The other was collected by W. McLennan in the Claudie River district and it is now in the H. L. White collection, Melbourne. The species is generally noted at the edge of the rain forest. There is

no difference between the bird from Tozer Gap and a specimen of *griseiceps* from New Guinea, in the Queensland Museum. The latter may be the type of *griseiceps*; De Vis was not particular about labelling his types.

The southern limit of its range appears to be the Claudie River district.

**HETEROMYIAS ALBISPECULARIS CINEREIFRONS (Ramsay). GREY-HEADED ROBIN.**

*Poecilodryas* (?) *cinereifrons* Ramsay, Proc. Zool. Soc. London, 1875, p. 588 (Cardwell, North Queensland).

MATERIAL.—Mt. Finnegan (R.F.), two males.

*H. a. cinereifrons* is another rain forest species which has not previously been recorded outside the Cairns-Cardwell area. The vicinity of Cooktown would appear to be the northern limit of its range in Australia.

**POECILODRYAS SUPERCILIOSA SUPERCILIOSA (Gould). WHITE-BROWED ROBIN.**

*Peteroica superciliosa* Gould, Proc. Zool. Soc. London, 1846, p. 106, 1847 (nr. Burdekin Lakes, North Queensland).

MATERIAL.—Shipton's Flat, two males, one (?).

Although all three specimens were obtained near Cooktown, the subspecies appears to be present throughout the Peninsula, and south to Rockhampton. *P. s. cerviniventris* is the form of the north-west and Northern Territory.

**EOPSALTRIA AUSTRALIS MAGNIROSTRIS Gould. YELLOW ROBIN.**

*Eopsaltria magnirostris* Gould, Ann. Mag. Nat. Hist., 4, 1869, p. 109 (Rockingham Bay, North Queensland).

MATERIAL.—Shipton's Flat, four males, two in spirit; Mt. Finnegan, one male.

The much brighter or more intense yellow of the undersurface and rump is a feature of this subspecies. Its presence in the vicinity of Cooktown extends the range north from Cairns. *E. a. magnirostris* occurs south to Rockhampton where it intergrades with *E. a. chrysorrhoea* which ranges south to about Sydney. South of Sydney, the latter gives way to *E. a. australis* which is found in the south-east, and west to South Australia.

**EOPSALTRIA CAPITO NANA Ramsay. PALE-YELLOW ROBIN.**

*Eopsaltria nana* Ramsay, Proc. Linn. Soc. New South Wales, 2, 1878, p. 372 (Cardwell, North Queensland).

MATERIAL.—Shipton's Flat (R.F.), two males, two males (?); Mt. Finnegan (R.F.), one juv. male.

These specimens from the Cooktown district extend the range of the species north from Cairns. The other subspecies, *E. c. capito*, is present in suitable habitat from about Rockhampton south to north-eastern New South Wales.



The generic grouping of Australian flycatchers affords difficulties, and I prefer to treat the matter conservatively. *Tregellasia* Mathews has been accepted by some workers for this species, but I do not know of any good reason for its retention.

**EOPSALTRIA LEUCOPS ALBIGULARIS** (Rothschild & Hartert). WHITE-FACED ROBIN.

*Poecilodryas leucops albigularis* Rothschild and Hartert, Nov. Zool., 14, 1907, p. 459 (Cape York, North Queensland).

MATERIAL.—Iron Range (R.F.), one male ; Nth. Claudie River (R.F.), two (?) ; Tozer Gap (R.F.), one male, three females ; Mount Tozer (R.F.), one in spirit ; Rocky Scrub (R.F.), two males, one female.

*E. l. albigularis* is the only representative of the *Eopsaltria* group in northern Cape York Peninsula. The specimens from the Rocky Scrub district extend the range southward to the end of the northern rain forest.

**PACHYCEPHALA RUFIVENTRIS RUFIVENTRIS** (Latham). RUFOUS WHISTLER.

*Sylvia rufiventris* Latham, Index. Orn. Suppl., 1801, p. 54 (Sydney, New South Wales).

MATERIAL.—Iron Range, one male ; Archer River, one female ; Coen River, one male ; Shipton's Flat, one female ; Helenvale, one male.

There is an incomplete north and south movement annually of this species in eastern Australia, and *rufiventris* would seem to be the only subspecies present.

**PACHYCEPHALA GRISEICEPS INORNATA** (Ramsay). GREY-BREASTED WHISTLER.

*Eopsaltria inornata* Ramsay, Proc. Zool. Soc. London, 1874, p. 604 (Rockingham Bay, North-east Queensland).

MATERIAL.—Tozer Gap (R.F.), one female ; Rocky Scrub (R.F.), one male ; Shipton's Flat (R.F.), one male.

This is the rain forest representative of the genus in Cape York Peninsula. *P. simplex* from the Northern Territory is not represented in available collections, but some years ago when I examined material, my view was that *simplex* and the present form are distinct species.

**COLLURICINCLA HARMONICA BRUNNEA** Gould. SHRIKE-THRUSH.

*Colluricincla brunnea* Gould, Proc. Zool. Soc. London, 1840, p. 164, 1841 (Port Essington, Northern Territory).

MATERIAL.—Portland Road, one female.

There is no doubt that both *brunnea* and *rufiventris* are subspecies of *harmonica*. About six or seven subspecies are present in Australia and Tasmania, but much material is required for a proper study of the species.

The Standing Committee on Ornithological Nomenclature has submitted an application to the International Commission on Zoological Nomenclature for the suppression of *Turdus phaeus* Forster which is a prior name for the species.

**MYIOLESTES MEGARHYNCHA GOULDI Gray. RUFOUS SHRIKE-THRUSH.**

*Myiolestes gouldi* Gray, Proc. Zool. Soc. London, 1858, p. 180 (Brown's River, Mid-east Queensland).

**MATERIAL.**—Nth. Claudie River (R.F.), two males, one male (?), one female ; Iron Range (R.F.), one male ; Tozer Gap (R.F.), two males ; Upper Nesbit River (R.F.), one male ; Peach River (R.F.), one male ; Shipton's Flat (R.F.), one male, one male (?), one in spirit ; Rossville Creek (R.F.), one female ; Upper Parrot Creek, Mt. Finnegan (R.F.) one female, one female (?) ; Mt. Finnegan (R.F.), one male.

*M. m. gouldi* was collected in or near rain forest at almost every locality visited by the party. Specimens of this subspecies are considerably smaller than those of the other Australian form, *M. m. rufogaster*, which ranges from the vicinity of Rockhampton south to north-eastern New South Wales.

**MYIOLESTES BOWERI (Ramsay). BOWER SHRIKE-THRUSH.**

*Colluricincla boweri* Ramsay, Proc. Linn. Soc. New South Wales, 10, 1885, p. 244 (Cairns, North Queensland).

**MATERIAL.**—Mt. Finnegan (R.F.), one male, one female.

The collecting of this pair in the Cooktown district extends the range of the species northwards from Cairns.

**ARTAMUS LEUCORHYNCHUS LEUCOPYGIALIS Gould. WHITE-BREASTED WOOD-SWALLOW.**

*Artamus leucopygialis* Gould, Bds. Austr., 2, 1842, p. 33 (Namoi River, New South Wales).

**MATERIAL.**—Wenlock, three females.

Gould's type locality is probably near the southern limit of the range of this form. *A. l. leucopygialis* is mainly a bird of the north in Australia, and it is probably the only subspecies.

**ARTAMUS CINEREUS HYPOLEUCUS Sharpe. BLACK-FACED WOOD-SWALLOW.**

*Artamus hypoleucus* Sharpe, Cat. Bds. Brit. Mus., 13, 1890, p. 17 (? Cape York Pen., North Queensland).

**MATERIAL.**—Brown's Creek, one female.

Gould described this form which has white under tail-coverts under the preoccupied name of *Artamus albiventris*. He remarked that only two specimens were available, one collected "on the Darling Downs, New South Wales" and the other to the north of that locality. They were obtained, presumably by Gilbert, during Leichhardt's expedition from Moreton Bay to Port Essington, and it is apparent that a mistake was made regarding the locality cited. Birds of the species with white under tail-coverts do not occur outside Cape York Peninsula ; certainly not as far south as the Darling Downs. It is highly probable that the specimens received by Gould were among the last collected by Gilbert before he was killed in western Cape York Peninsula.

In a small series of specimens from near Normanton at the base of the Gulf of Carpentaria, the anterior half of the under tail-coverts is black and the remainder is white. The same can be said of a series from the Roper River, Northern Territory, except for one specimen in which these coverts are black with a narrow white tip on each feather. In birds from southern Queensland the under tail-coverts are either entirely black, or black with each feather tipped white.

The single specimen from Brown's Creek has the under tail-coverts white with some obscure black flecks anteriorly.

**ARTAMUS MINOR** Vieillot. LITTLE WOOD-SWALLOW.

*Artamus minor* Vieillot, Nouv. Dict. d'Hist. Nat., 17, 1817, p. 289 (Sydney, New South Wales).

MATERIAL.—Between Archer River and Deep Creek, one male.

The species is confined mainly to the northern half of Australia. No difference has been noted in specimens from widely separated localities.

**MELITHREPTUS ALBOGULARIS VINITINCTUS** De Vis. WHITE-THROATED HONEY-EATER.

*Melithreptus vinitinctus* De Vis, Proc. Roy. Soc. Qld., 1, 1884, p. 159 (Norman River, North Queensland).

MATERIAL.—Portland Road, one (?); Iron Range, one male; Wenlock, two males; Peach River, one male; Coen River, one in spirit; Shipton's Flat, two males.

Despite the similarity in size and appearance of *Melithreptus albogularis* and *M. lunatus*, the two are distinct species. An examination of a reasonable series of specimens soon makes this plain, although the only constant external difference is that *lunatus* has the chin black and a slightly greater extent of black on the sides of the face, whereas in *albogularis* these parts are white.

*M. lunatus* ranges from the vicinity of Herberton, north-east Queensland, south in coastal areas to southern Australia and west to south-western Australia. *M. albogularis* occurs in coastal northern Australia, from the north-west to the east and south to northern New South Wales. This species also is present in south-east New Guinea. The ranges of the two species overlap over a large part of eastern Australia, but there is no interbreeding.

Cape York Peninsula birds, at least north from Cardwell, are lighter, more yellowish on the back, and for these I am using *vinitinctus* De Vis which is the oldest available name.

**MYZOMELA SANGUINOLENTA** (Latham). SCARLET HONEYEATER.

*Certhia sanguinolenta* Latham, Index Orn. Suppl., 1801, p. 37 (Sydney, New South Wales).

MATERIAL.—Shipton's Flat, four males, one female.

In coastal areas from Cooktown south towards southern New South Wales and occasionally Victoria is the range of this species. An incomplete annual north-south movement takes place, and probably as a consequence, there has been no subspecies differentiation.

**MYZOMELA PECTORALIS Gould. BANDED HONEYEATER.**

*Myzomela pectoralis* Gould, Proc. Zool. Soc. London, 1840, p. 170, 1841 (North-western Australia).

MATERIAL.—Wenlock River, one male ; Hann River, one male, one imm.

I have no material from the north-west and Northern Territory for comparison, but if Mathews' measurements are accepted, then *M. p. incerta* which he provided for Cape York Peninsula birds has no standing. The two adult specimens recorded here have wing measurements of 66 and 70 mm. respectively.

**MYZOMELA OBSCURA HARTERTI Mathews. DUSKY HONEYEATER.**

*Myzomela obscura harterti* Mathews, Bull. Brit. Ornith. Club, 27, 1911, p. 100 (Cairns, North Queensland).

MATERIAL.—Portland Road, one male, one (?) ; Iron Range, one male, one female ; Tozer Gap, three males, one female ; Brown's Creek, two males ; Rocky Scrub, one female, one (?) ; Shipton's Flat, one male, one in spirit ; Helenvale, two in spirit.

*M. o. harterti* was collected at almost every locality visited in Cape York Peninsula. Sight records of this species in southern Queensland are incorrect ; probably the species seen and heard would be *Lichmera indistincta* subspecies.

**MELIPHAGA LEWINI Swainson. LEWIN HONEYEATER.**

*Meliphaga (Ptilotis) lewini* Swainson, Class Bds., 2, 1837, p. 326 (New South Wales).

MATERIAL.—Rocky Scrub, one male ; Mt. Finnegan, one female.

The similarity of colour and colour pattern in *M. lewini*, *M. analago* and *M. gracilis* is remarkable. Size is almost the only character by which they can be separated, and while *gracilis*, the smallest, is easily determined by this means, I consider that it would not be possible to separate *lewini* and *analago* in the field even by this means.

*M. lewini* ranges from about the Rocky Scrub district south in coastal areas to New South Wales and eastern Victoria, where it is uncommon. It is the common honeyeater of eastern Queensland, and I have been unable to separate the Peninsula specimens from a good series taken in southern Queensland. It is not possible, therefore, to accept any of Mathews' subspecies.

**MELIPHAGA ANALAGO NOTATA (Gould). LESSER LEWIN HONEYEATER.**

*Ptilotis notata* Gould, Ann. Mag. Nat. Hist., 20, 1867, p. 269 (Cape York, North Queensland).

MATERIAL.—North Claudie River, one female ; Iron Range, one male ; Mount Tozer, one male ; Tozer Gap, two males ; Shipton's Flat, one male, one (?), two in spirit ; Rocky Scrub, one female ; Brown's Creek, one (?).

This is the only Australian subspecies of *analago*. It ranges from Cape York south to about Cardwell.

**MELIPHAGA GRACILIS GRACILIS (Gould). GRACEFUL HONEYEATER.**

*Ptilotis gracilis* Gould, Proc. Zool. Soc. London, 1866, p. 217 (Cape York, North Queensland).

MATERIAL.—Portland Road, one male ; Iron Range, one male ; Tozer Gap, two males (?) ; Brown's Creek, one male, one female.

With the same range as *M. a. notata*, from Cape York south to Cardwell, this is the only Australian subspecies of *gracilis*.

**MELIPHAGA VERSICOLOR VERSICOLOR (Gould). VARIED HONEYEATER.**

*Ptilotis versicolor* Gould, Proc. Zool. Soc. London, 1842, p. 136, 1843 (Cape York, North Queensland).

MATERIAL.—Portland Road, one male, three females.

Although superficially similar to *M. virescens*, this is nevertheless a distinct species. It is a bird of the mangroves in eastern Cape York Peninsula from Cape York to the vicinity of Cardwell.

**MELIPHAGA FRENATA (Ramsay). BRIDLED HONEYEATER.**

*Ptilotis frenata* Ramsay, Proc. Zool. Soc. London, 1874, p. 603, 1875 (Cardwell. North Queensland).

MATERIAL.—Shipton's Flat, three males.

Known at present only from the Cairns-Cardwell area, these three specimens from Shipton's Flat extend the range of the species north to the vicinity of Cooktown.

**MELIPHAGA NOVAE-HOLLANDIAE BARRONI (Mathews). YELLOW-FACED HONEY-EATER.**

*Ptilotis chrysops barroni* Mathews, Nov. Zool, 18, 1912, p. 406 (Cairns, North Queensland).

MATERIAL.—Shipton's Flat, two males ; Mt. Finnegan, one (?).

Both Mathews and A. J. Campbell have described the Cairns-Cardwell birds as a subspecies. Compared with examples of the species from south-east Queensland, the three birds from near Cooktown, which agree with Cairns-Cardwell birds, have longer bills. This is the only difference noted.

Iredale (1937) has noted that *Muscicapa novae-hollandiae* Latham is a prior name for this species.



**MELIPHAGA MACLEAYANA (Ramsay). MACLEAY HONEYEATER.**

*Ptilotis macleayana* Ramsay, Proc. Linn. Soc. New South Wales, 1, 1875, p. 10 (Cooktown, North Queensland).

**MATERIAL.**—Shipton's Flat, five males, two imm.

These seven specimens from Shipton's Flat are the first which I have examined from other than the Cairns-Cardwell area. The birds do not differ throughout this limited range.

**MELIPHAGA FLAVA (Gould). YELLOW HONEYEATER.**

*Ptilotis flava* Gould, Proc. Zool. Soc. London, 1842, p. 136, 1843 (Cape York, North Queensland).

**MATERIAL.**—Wenlock, one male, one female ; Shipton's Flat, one male, one (?).

Gould named this species from a single example obtained by the officers of H.M.S. Beagle while employed on the "north coast." Mathews, by inference, has designated Cape York as the type locality, and he has provided a name for a bird or birds with Inkerman, north-east Queensland as the type locality.

The Yellow Honeyeater appears to be confined to Cape York Peninsula, south to the Cairns-Cardwell area. It may extend south to Inkerman or even to Rockhampton, but Mathews' material from Inkerman, on which he based many names, must be considered doubtful. He recorded species from this locality which do not occur in eastern Queensland.

The inclusion of the Northern Territory in the range of *flava* appears to be based on McLennan's record of the species at Pera Head, Cape York Peninsula, while travelling by boat around the Gulf of Carpentaria to the King River, Northern Territory in 1915.

**TRICHODERE COCKERELLI (Gould). WHITE-STREAKED HONEYEATER.**

*Ptilotis cockerelli* Gould, Bds. Austr. Suppl., 1869, p. 43 (Cape York, North Queensland).

**MATERIAL.**—Brown's Creek, three males ; Shipton's Flat, two males.

This honeyeater has not previously been recorded south of the Archer River. The retention of North's genus, *Trichodere*, requires more consideration.

**XANTHOTIS CHRYSOTIS FILIGERA (Gould). TAWNY-BREASTED HONEYEATER.**

*Ptilotis filigera* Gould, Bds. Austr. Suppl., 1851, p. 42 (Cape York, North Queensland).

**MATERIAL.**—Tozer Gap, two males, one in spirit.

There is only one Australian subspecies of this honeyeater, and apparently the southern limit of its range is the Claudie River district.



**ENTOMYZON CYANOTIS HARTERTI** Robinson & Laverock. BLUE-FACED HONEYEATER.

*Entomyzon cyanotis harterti* Robinson and Laverock, Ibis, 1900, p. 635 (Cooktown, North Queensland).

MATERIAL.—Wenlock, one female ; Archer River, one female.

*E. c. harterti* is considerably smaller than *E. c. cyanotis*. Both *connectens* and *hedleyi* of Mathews are synonyms of this north-east Queensland subspecies.

**PHILEMON NOVAEGUINEAE YORKI** Mathews. HELMETED FRIAR-BIRD.

*Philemon beuceroides yorki* Mathews, Austr. Av. Rec., 1, 1912, p. 102 (Cape York, North Queensland).

MATERIAL.—Shipton's Flat, one male ; Helenvale, one male.

This subspecies of *P. novaeguineae* ranges south at least to the Cairns-Cardwell area.

**PHILEMON ARGENTICEPS KEMPI** Mathews. SILVER-CROWNED FRIAR-BIRD.

*Philemon kempi* Mathews, Austr. Av. Rec., 1, 1912, p. 101 (Melville Island, Northern Territory).

MATERIAL.—Portland Road, one female ; Brown's Creek, one female ; Wenlock one male ; Shipton's Flat, one male, one female.

The raised portion of the culmen in these Cape York Peninsula birds is much smaller than in specimens from the Northern Territory. Otherwise, there seems to be little difference.

Although Mathews named a subspecies of *argenticeps* from Melville Island, his *P. b. gordonii* also appears to be based on an example of *argenticeps* from the same island.

**CINNYRIS JUGULARIS AUSTRALIS** (Gould). YELLOW-BREASTED SUNBIRD.

*Nectarinia australis* Gould, Jardine's Contr. Orn., 1850, p. 106 (Port Molle, North Queensland).

MATERIAL.—Iron Range, two males, two females.

This is the only subspecies of the Sunbird in Australia. It ranges from Cape York south to Rockhampton.

**DICAEUM HIRUNDINACEUM** (Shaw). MISTLETOE BIRD,

*Motacilla hirundinacea* Shaw, Nat. Miscel., 4, 1792, p. 114 (New South Wales).

MATERIAL.—Portland Road, one (?) ; Shipton's Flat, one male, one female.

Although widely distributed in Australia, no subspecies of the Mistletoe-bird have been recognised.

**PARDALOTUS MELANOCEPHALUS BARRONI** Mathews. BLACK-HEADED PARDALOTE.

*Pardalotus melanocephalus barroni* Mathews, Austr. Av. Rec., 1, 1912, p. 96 (Cairns, North Queensland).

MATERIAL.—Archer River, one male ; Mount Finnegan, one in spirit.

This northern subspecies is readily recognised; specimens have markedly paler backs and rumps than those from southern Queensland.

The seven species of this genus generally accepted in Australia can be readily reduced to five. *P. xanthopygus* is a subspecies of *P. punctatus*, and *P. ornatus* is a subspecies of *P. striatus*.

**ZOSTEROPS LATERALIS RAMSAYI** Masters. GREY-BREASTED SILVEREYE.

*Zosterops ramsayi* Masters, Proc. Linn. Soc. New South Wales, 1, 1876, p. 56 (Palm Island, E. Queensland).

MATERIAL.—Iron Range, one male; Upper Parrot Creek, Mt. Finnegan, one male, two females.

In an earlier paper (Mack, 1932) I doubtfully included north-east Queensland silvereyes as *Z. tephroleura*. Although the striking similarity in colour of plumage holds good, on size alone, I now consider that birds from Cape York Peninsula south probably to Rockhampton should be referred to *Z. l. ramsayi*.

The single example from Iron Range extends the range of the species northwards from the Coen district.

**STEGANOPLEURA BICHENOVII BICHENOVII** (Vigors & Horsfield). BANDED FINCH.

*Pringilla bichenovii* Vigors and Horsfield, Trans. Linn. Soc. London, 15, 1827, p. 258 (Broad Sound, Mid-east Queensland).

MATERIAL.—Archer River, one female.

*S. bichenovii* from northern New South Wales and Queensland has white upper tail coverts, and *S. annulosa* from the north-west and Northern Territory has black upper tail coverts. Hill (1913) has stated that both forms occur at Borraloola and do not appear to interbreed. Material is necessary, especially from the base of the Gulf of Carpentaria, to decide whether these two forms are species or subspecies. For the present, they are considered to be subspecies.

**ÆGINTHA TEMPORALIS MINOR** Campbell. RED-BROWED FINCH.

*Ægitha minor* Campbell, Nests and Eggs Austr. Bds., 1, 1901, p. 492 (Cape York, North Queensland).

MATERIAL.—Portland Road, one male; Claudie River, one female; Iron Range, one female; Tozer Gap, one male; Shipton's Flat, one female, one (?).

Smaller in size, more yellowish above and lighter beneath, *A. t. minor* is a distinct subspecies of Cape York Peninsula.

**POEPHILA CINCTA ATROPYGIALIS** Diggles. BLACK-THROATED FINCH.

*Poephila atropygialis* Diggles, Trans. Phil. Soc. Qld., pt. 1, 1876 (Normanton, North Queensland).

MATERIAL.—Archer River, one male.

The Archer River specimen is to be referred to *atropygialis* which is a subspecies of *P. cineta*. The upper tail-coverts are black, except for a few feathers which are finely tipped white. Specimens are available with varying proportions of black and white in the upper tail-coverts according to locality.

*P. c. atropygialis* appears to be the subspecies of Cape York Peninsula, possibly ranging south to the vicinity of Cardwell.

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## NOTES ON THE AUSTRALIAN STOMATOPODA (CRUSTACEA) IN THE COLLECTIONS OF THE QUEENSLAND MUSEUM.

W. STEPHENSON.

University of Queensland.

### INTRODUCTION.

The collections were consulted while examining specimens in the Zoology Department, University of Queensland (Stephenson, 1952), and found to contain several species not recorded from Australia. The localities of others add materially to the knowledge of stomatopod distribution within the Commonwealth. Possibly the most interesting specimen is the holotype of *Lysiosquilla miersi* De Vis, known only from this specimen, which has not been figured.

Additions have been made to the collections from University material, including some specimens which have already been commented upon (Stephenson, 1952). These include *Squilla fasciata* de Haan, and *Gonodactylus tweediei* Serène. Some very recent additions to the University collections have been largely incorporated in the Museum collections, and are reported upon in this paper.

The references which follow the specific names are purposely abbreviated by the exclusion of the majority of authors prior to Kemp's (1913) monograph. The earlier references given include the original descriptions, and others which provide additional or better figures than those given by Kemp. When specimens are not identical with Kemp's descriptions, the differences are detailed.

Lengths of specimens have been measured in the mid-dorsal line from the posterior end of the telson to the anterior edge of the carapace, excluding the rostrum. Owing to curvature or extensibility of many specimens these measurements are accurate only to about  $\pm 1\%$  or 1 mm., whichever is the larger.

### SQUILLA LAEVIS Hess.

*Squilla laevis* Hess, 1865, Arch. Naturgesch., Jahrg. 31, p. 170, pl. 7, fig. 22; Kemp, 1913, Mem. Ind. Mus., 4, pp. 49-50, pl. 3, figs. 35-37.

MATERIAL.—Brisbane River, male and female; Doboy Creek, Brisbane River, one female; Moreton Bay, female; Mud Island, Moreton Bay, one male, two females.

LENGTHS.—Males, 70-90 mm.; females, 67-92 mm.

Previous Australian records have been summarised by Stephenson (1952).

### SQUILLA QUINQUEDENTATA Brooks.

*Squilla quinquedentata* Brooks, 1886, Voy. H.M.S. Challenger, Zool., 16, pp. 26-30, pl. 1, fig. 3, pl. 2, fig. 6; Kemp, 1913, Mem. Ind. Mus., 4, pp. 52-3, p. 195; Holthius, 1941, Temminkia, 6, pp. 244-5.

**MATERIAL.**—Townsville, prawn-trawled in 3-5 fathoms between Magnetic Island and the mainland, two males and two females.

**LENGTHS.**—Males, 100 and 133 mm. ; females, 155 and 157 mm.

A new Australian record. Three other females (96-134 mm.) were sent from Townsville to the University of Queensland.

#### **SQUILLA FOVEOLATA Wood Mason.**

*Squilla foveolata* Wood Mason, 1895, Figs. and Desc. of Nine Squillidae, p. 2, pl. 2, fig. 1 ; Kemp, 1913, Mem. Ind. Mus., 4, pp. 58-60, pl. 4, fig. 48.

**MATERIAL.**—Townsville, prawn-trawled in 3-5 fathoms, between Magnetic Island and the mainland, one female.

**LENGTH.**—103 mm.

A new Australian record.

#### **SQUILLA NEPA Latreille.**

*Squilla nepa* Latreille, Encycl. Method., 10, p. 471 ; Kemp, 1913, Mem. Ind. Mus., 4, pp. 60-4, p. 195, pl. 4, fig. 49 ; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 179-82, figs. 2, 3 ; Barnard, 1950, Ann. S. African Mus., 38, pp. 847-8, figs. 1b, 2a.

**MATERIAL.**—Townsville, prawn-trawled in 3-5 fathoms, between Magnetic Island and the mainland, one female.

**LENGTH.**—78 mm.

This species has been recorded from Port Curtis by Miers (1880), but the record is doubtful because Miers did not distinguish between *S. nepa*, *S. oratoria* de Haan, *S. inornata* Tate, and *S. anomala* Tweedie. Haswell's (1882) record is almost certainly a transcription from Miers' paper. Henderson (1893, p. 452) included "Australia" in his distributional data on *S. nepa*, but according to Kemp he confused this species with *S. holoschista* Kemp.

The present specimen is therefore the first definite Australian record.

#### **SQUILLA INORNATA Tate.**

*Squilla inornata* Tate, 1883, Trans. Roy. Soc. S. Austr., 6, p. 51, pl. 2, figs. 3a-c.

*Squilla affinis* var. *intermedia* Nobili, 1903, Bull. Mus. Zool. Anat. Comp. Torino, 18, No. 455, p. 38.

*Squilla oratoria* var. *perpensa* Kemp, 1913, Mem. Ind. Mus., 4, pp. 70-2, pl. 5, figs. 57-9.

*Squilla oratoria* var. *inornata* Hale, 1924, Rec. S. Austr. Mus., 2, pp. 495-6 ; Chopra, 1935, Rec. Ind. Mus., 36, pp. 24-5 ; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 183-5, fig. 6 ; Holthius, 1941, Temminkia, 6, pp. 248-9 ; Lui, 1949, Contrib. Inst. Zool. Nat. Acad. Peiping, 5, pp. 37-8, figs. 2a-b.

*Squilla oratoria inornata* Tweedie, 1935, Bull. Raffles Mus., 10, pp. 45-8.

**MATERIAL.**—Bowen, two females, one from "Endeavour" collection.

**LENGTHS.**—60 and 105 mm.

Since Kemp's monograph was published, two additional species in the *Squilla oratoria*—*S. interrupta* group have been described, viz., *S. anomala* Tweedie 1935, and *S. fabricii* Holthius 1941. It is evident that within this group, perfectly good species are recognised on inconspicuous characters. The order of magnitude of the differences between *Squilla oratoria* de Haan and *S. inornata* Tate has frequently been commented upon in the literature and is definitely as great as those between other members of the group. In fact Tate's species seems to be closest to *S. anomala*. Under these circumstances there appears to be no sound reason for referring Tate's form to subspecific status.

In the specimens examined, the joints of the antennular peduncle are relatively longer and thinner than those figured by Kemp. The borders of the free thoracic segments also differ slightly and are nearer to Lui's figure. The carina on the raptorial carpus is less conspicuous than those figured by both of these workers, and it is more obtusely angled in conformity with Tweedie's description.

Previous Australian records are from S. Australia (Tate, 1883), N. Australia (Miers, 1880) and Cairns, Queensland (Hale, 1924).

#### **SQUILLA INTERRUPTA Kemp.**

*Squilla interrupta* Kemp, 1911, Rec. Ind. Mus., 6, p. 98; Kemp, 1913, Mem. Ind. Mus., 4, pp. 72-4, pl. 5, figs. 60-2; Tweedie, 1935, Bull. Raffles Mus., 10, p. 48; Holthius, 1941, Temminckia, 6, pp. 252-4; Lui, 1949, Contrib. Inst. Zool. Nat. Acad. Peiping, 5, pp. 39-41, text-figs. 3a, b.

**MATERIAL.**—Rockhampton, female; Gladstone, female; Brisbane River, two males, five females; Moreton Bay, one male, four females; Southport, one male; Burleigh Heads, one male.

**LENGTHS.**—Males, 100-135 mm.; females, 90-140 mm.

The only previously known Australian localities are in S. Queensland (Boone, 1934; Stephenson, 1952) where the species is evidently common.

#### **SQUILLA WOODMASONI Kemp.**

*Squilla woodmasoni* Kemp, 1911, Rec. Ind. Mus., 6, p. 99; Kemp, 1913, Mem. Ind. Mus., 4, pp. 74-6, pl. 5, figs. 63-5; Hansen, 1926, Siboga Exped., 104 Livr. Monogr. 35, p. 12; Holthius, 1941, Temminckia, 6, p. 255; Lui, 1949, Contrib. Inst. Zool. Nat. Acad. Peiping, 5, pp. 42-3, pl. 6, figs. 12-14; Stephenson, 1952, Zool. Pap. Univ. Queensland, I, pp. 5-6.

**MATERIAL.**—Tin Can Bay, near Inskip Point, in 5 fathoms, female; Townsville, prawn-trawled in 3-5 fathoms between Magnetic Island and the mainland, female.

**LENGTHS.**—87 and 115 mm.

Three males (87-99 mm.) were sent from Townsville to the University of Queensland. Previous Australian records have been summarised recently (Stephenson 1952).



**SQUILLA DEPRESSA (Miers).**

*Chloridella depressa* Miers, 1880, Ann. Mag. Nat. Hist., Ser. 5, 5, pp. 14-15, pl. 2, figs. 1-4.

*Squilla depressa* Sèrene, 1952, Rec. Aust. Mus., 23, pp. 2-11, figs. 3, 4, 9, 18, 21, pl. 1, fig. 3, pl. 2, figs. 3, 6, 7, 8, 9, 10; Stephenson, 1952, Zool. Pap. Univ. Queensland, 1, p. 8.

MATERIAL.—Sandgate, male; Russell Island, Moreton Bay, female.

LENGTHS.—Male, 85 mm.; female, 72 mm.

The pigmentation of the female is similar to a recently collected male (Stephenson, 1952) but is somewhat denser. The chestnut-brown colour of the hairs fringing the abdominal pleopods is a distinctive character in recently preserved specimens.

The species is known only from Australia.

**SQUILLA RAPHIDEA Fabricius.**

*Squilla raphidea* Fabricius, 1798, Ent. Syst. Suppl., p. 416; Kemp, 1913, Mem. Ind. Mus., 4, pp. 88-92, pl. 7, fig. 77; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 186-9, figs. 8-10; Lui, 1949, Contrib. Inst. Zool. Nat. Acad. Peiping, 5, pp. 43-4, pl. 7, figs. 15-16; Barnard, 1950, Ann. S. African Mus., 38, pp. 851-2, fig. 1 c, g; Stephenson, 1952, Zool. Pap. Univ. Queensland, 1, pp. 4-5.

MATERIAL.—Cooktown, female; Peel Island, Moreton Bay, female; Southport, male.

LENGTHS.—Male, 163 mm.; females, 167 and 222 mm.

**SQUILLA ANOMALA Tweedie.**

*Squilla anomala* Tweedie, 1935, Bull. Raffles Mus., 10, pp. 45-8; Holthius, 1941, Temminkia, 6, p. 253; Stephenson, 1952, Zool. Pap. Univ. Queensland, 1, pp. 7-8.

MATERIAL.—Townsville, prawn-trawled in 3-5 fathoms between Magnetic Island and the mainland, five males and six females.

LENGTHS.—Males, 73-98 mm.; females, 63-110 mm.

Three other males (60-74 mm.) were sent from Townsville to the University of Queensland. This species, which has only recently been added to the Australian fauna (Stephenson, 1952), was the most common stomatopod in a collection received from Townsville in May 1952.

**HEMISQUILLA STYLIFERA (H. M. Edwards).**

*Gonodactylus styliferus* H. M. Edwards, 1837, Hist. Nat. Crust., 2, p. 330, pl. 27, figs. 9-14.

*Hemisquilla stylifera* Kemp, 1913, Mem. Ind. Mus., 4, pp. 106-8, pl. 7, figs. 84-5; Schmitt, 1940, Allan Hancock Pac. Expd., 5, pp. 182-3.

MATERIAL.—Victorian coast, "Endeavour" collection, three males.

LENGTHS.—138-156 mm.

All mandibular palps are two segmented. One specimen has only a single rounded lobe between the submedian and intermediate spines of the telson as in Schmitt's figure. The other two specimens have two lobes in this position as in Kemp's text-figure. The existence of this variation in Australian specimens means that "distinct races" (Kemp) of American and Australian forms cannot be distinguished.

**PSEUDOSQUILLA CILIATA (Fabricius).**

*Squilla ciliata* Fabricius, 1787, Mantiss. Insect, 1, p. 333.

*Pseudosquilla ciliata* Kemp, 1913, Mem. Ind. Mus., 4, pp. 96-100; Bigelow, 1931, Bull. Mus. Comp. Zool. Harv., 77, pp. 152-60, text-figs. 3-6; Boone, 1934, Bull. Vanderbilt Mar. Mus., 5, pp. 16-20, pl. 4; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 91-3; Barnard, 1950, Ann. S. African Mus., 38, pp. 852, 854, fig. 3a.

**MATERIAL.**—Murray Island, two females; Amity, Moreton Bay, female; Myora, Moreton Bay, two females; Southport, female.

**LENGTHS.**—50-80 mm.

These records extend the Australian distribution to the entire coast of eastern Queensland.

**PSEUDOSQUILLA PILAENSIS de Man.**

*Pseudosquilla pilaensis* de Man, 1888, J. Linn. Soc. Lond., 22, p. 296; Kemp, 1913, Mem. Ind. Mus., 4, pp. 105-6; Schmitt, 1929, Lingnan Sci. J., 8, pp. 140-3, pl. 19, figs. 12-14; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 193-4, fig. 13.

**MATERIAL.**—Bowen, one male.

**LENGTH.**—47 mm.

A new Australian record. The nearest locality record appears to be the Mergui Archipelago (de Man, 1888).

**LYSIOSQUILLA MACULATA (Fabricius).**

*Squilla maculata* Fabricius, 1793, Ent. Syst., 2, p. 511.

*Lysiosquilla maculata* Kemp, 1913, Mem. Ind. Mus., 4, pp. 111-6, pl. 8, figs. 86-91; Edmonston, 1921, Occ. Pap. Bernice P. Bishop Mus., 7, pp. 169-73, text-figs. 9A, B; Boone, 1934, Bull. Vanderbilt Mar. Mus., 5, pp. 21-8, pls. 5, 6; Chopra, 1935, Rec. Ind. Mus., 36, pp. 28-30; Holthius, 1941, Temminkia, 6, pp. 269-72; Barnard, 1950, Ann. S. African Mus., 38, pp. 855-6, fig. 3d.

*Lysiosquilla miersi* De Vis, 1883, Proc. Linn. Soc. N.S.W., 7, pp. 321-2; Bigelow, 1894, Proc. U.S. Nat. Mus., 17, p. 504; Kemp, 1913, Mem. Ind. Mus., 4, pp. 116-7.

**MATERIAL.**—Thursday Island, one male, two females; Bribie Island, female; Moreton Island, Moreton Bay, female; Stradbroke Island, Moreton Bay, three males, one female; Moreton Bay, female (Type of *L. miersi*); Tweed River, New South Wales, one female; Boolgin, Cape Levêque, nr. Derby, Western Australia, male and female.

**LENGTHS.**—Males, 160-220 mm.; females, 150-350 mm.

These records extend the known Queensland range from Low Is. (Stephenson *et al* 1931) north to Thursday I., and southwards to the New South Wales border.

In the type of *L. miersi* the rostrum is intermediate in shape between those shown in Kemp's figures of *L. maculata* (fig. 86) and his *L. maculata* var. *sulcirostris* (fig. 92). Exactly similar rostra were noted in seven specimens of *L. maculata* in the Museum collections. The shape of the carapace is a very doubtful diagnostic feature in that the regions outside the gastric grooves are completely decalcified. After allowing for this it compares very closely indeed with that of *L. maculata*.

The exposed somites of the thorax and abdomen, except the last abdominal somite, are decalcified dorsally. The decalcified tergites are papery in consistency and irregularly wrinkled like paper. This is almost certainly an artefact. The wrinkling of the last abdominal somite is similar to the more extensively wrinkled specimens of *L. maculata* in the collections.

The median elevation of the telson is identical with that of *L. maculata*. De Vis' use of the phrase "a bold sagittate median ridge" is too emphatic, and Kemp's description of the ridge in *L. maculata* agrees with that in the type of *L. miersi*.

The ten teeth on the raptorial dactylus are long and slender and the terminal one is not noticeably "anteriorly dilated" as described by De Vis. They are serrated on their posterior edges as De Vis noted, and also on their anterior edges, which he failed to note. In this respect, as in the general shape and proportions of the segments of the claw as a whole, the holotype of *L. miersi* resembles all the specimens of *L. maculata* in the Museum collections, except for two large females which show the expected modifications associated with their sex and size.

The colour of the specimen has evidently changed since De Vis prepared his description. The anterior half is dark chestnut-brown with irregular transparent areas. The free thoracic and the first five abdominal somites are mostly transparent, but with irregular longitudinal lines of chestnut colour in the submedian and lateral regions. The last abdominal somite and the telson are chestnut-brown merging into horn colour.

If the colour as described by De Vis is compared with Kemp's description of *L. maculata* the only difference would appear to be the presence in *L. miersi* of "a conspicuous white longitudinal band on each side of the dorsum."

It is concluded that De Vis' description is partly based on artefacts, and is partly inaccurate. The holotype is a specimen of *Lysiosquilla maculata* (Fabr.).

#### LYSIOSQUILLA PERPASTA Hale.

*Lysiosquilla perpasta* Hale, 1924, Rec. S. Austr. Mus., 2, pp. 497-9, pl. 33, fig. 1, text-fig. 382; Hale, 1927, Crustaceans South Australia, p. 33, fig. 23.

MATERIAL.—Bird Island, Moreton Bay, male and female; Myora, Moreton Bay, male.

LENGTHS.—Males, 20 and 26 mm.; female, 27 mm.

The only known Queensland localities are in Moreton Bay. The species ranges from southern Queensland to South Australia, but has not been recorded outside the Commonwealth.

**LYSIOSQUILLA VERCOI Hale.**

*Lysiosquilla vercoi* Hale, 1924, Rec. S. Austr. Mus., 2, pp. 499-501, pl. 33, fig. 2, text-fig. 383; Hale, 1927, Crustaceans South Australia, pp. 33-4, fig. 24.

MATERIAL.—Southport, female.

LENGTH.—51 mm.

The specimen differs from Hale's description in (a) the absence of chromatophores which is presumably an artefact; (b) the spine on the ischium of the raptorial claw is sharper than shown in the figure by Hale; and (c) in possessing additional spines on the raptorial dactylus.

The specimen has 20 spines on each dactylus as against 11 and 12 on the two sides of the holotype. Variation in the number of spines has also been noted in specimens from other collections in Australia.

The species has not been recorded previously from Queensland.

**ODONTODACTYLUS CULTRIFER (White).**

*Gonodactylus cultrifer* White, 1850, Proc. Zool. Soc. Lond., pp. 96-7, pl. 16, figs. 1, 2.

*Gonodactylus carinifer* Pocock, 1893, Ann. Mag. Nat. Hist., ser. 6, 11, p. 478, pl. 25, figs. 4, 4a, 4b.

*Odontodactylus carinifer* Kemp, 1913, Mem. Ind. Mus., 4, pp. 138-9.

*Odontodactylus cultrifer* Kemp, 1913, Mem. Ind. Mus., 4, pp. 137-8; Sumier, 1915-18, Contrib. Faune Indes Neerl. Inst. Sci. Buitenzorg, 1, pp. 72-4; Hansen, 1926, Siboga Exped., 104 Livr., Monogr. 35, p. 23; Kemp and Chopra, 1921, Rec. Ind. Mus., 22, pp. 307-8; Stephenson, 1952, Zool Pap. Univ. Queensland, 1, pp. 10-11.

MATERIAL.—Mud Island, Moreton Bay, two females.

LENGTHS.—69 and 78 mm.

Both specimens have three teeth on each raptorial dactylus. The only known Australian locality is Moreton Bay, where the species appears to be common.

**ODONTODACTYLUS SCYLLARUS (Linn.).**

*Cancer scyllarus* Linnaeus, 1767, Syst. Nat., 12th Ed., 1, Pt. 2, p. 1054.

*Odontodactylus scyllarus* Borradaile, 1898, Proc. Zool. Soc. Lond., p. 36, pl. 5, fig. 6; Kemp, 1913, Mem. Ind. Mus., 4, pp. 135-7; Kemp and Chopra, 1921, Rec. Ind. Mus., 22, pp. 307-8; Komai, 1927, Mem. Coll. Sci. Kyoto. Imp. Univ., Ser. B, 3, pp. 335-6, pl. 13, fig. 2; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 200-2, figs. 17-19.

MATERIAL.—Townsville, female; Cape Cleveland, female; Noosaville, female.

LENGTHS.—73-133 mm.

A new Australian record.

**GONODACTYLUS CHIRAGRA (Fabricius).**

*Squilla chiragra* Fabricius, 1781, Species Insectorum, 1, p. 515.

*Gonodactylus chiragra* Kemp, 1913, Mem. Ind. Mus., 4, pp. 155-62, Pl. 9, fig. 107; Bigelow, 1931, Bull. Mus. Comp. Zool. Harv., 77, pp. 113-6, pl. 2, fig. 1; Boone, 1934, Bull. Vanderbilt Mar. Mus., 5, pp. 11-13, pl. 1, 2A, B; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 202-4; Holthius, 1941, Temminckia, 6, pp. 277-81, figs. 7a, b.

MATERIAL.—Murray Island, four males, four females; Yorke Island, five males; Fantome Island, two females; Keeper Reef, male and female; Orpheus Island, female; Mackay, female; Moreton Bay, two males, one female.

LENGTHS.—Males, 29-72 mm.; females, 34-78 mm.

This is the Australian stomatopod which has been most frequently recorded in the literature.

**GONODACTYLUS FALCATUS (Forskål).**

*Cancer falcatus* Forskal, 1775, Decc. Anim., No. 60, p. 96.

*Gonodactylus glabrous* Brooks, 1886, Voy. H.M.S. Challenger, Zool., 16, pp. 62-4, pl. 14, fig. 5, pl. 15, figs. 7, 9; Kemp, 1913, Mem. Ind. Mus., 4, pp. 167-9, pl. 9, fig. 113, text-fig. 2 on p. 170; Bigelow, 1931, Bull. Mus. Comp. Zool. Harv., 77, pp. 127-35, text-fig. 1; Boone, 1934, Bull. Vanderbilt Mar. Mus., 5, pp. 13-16, pl. 3; Gravier, 1938, Mem. Inst. Egypte, 37, pp. 178-83, fig. 5, fig. D; Barnard, 1950, Ann. S. African Mus., 38, p. 863, fig. 3f.

*Gonodactylus falcatus* Holthius, 1941, Temminckia, 6, pp. 284-8, fig. 9a.

MATERIAL.—Queensland, two males, two females; Yorke Island, male; Pandora Reef, Brooke Island, male; Moreton Bay, male and female.

LENGTHS.—Males, 34-49 mm.; females, 42-51 mm.

Australian records have been summarised by Stephenson (1952).

**GONODACTYLUS GRAPHURUS Miers.**

*Gonodactylus graphurus* Miers, 1875, Ann. Mag. Nat. Hist., Ser. 4, 16, p. 344; Brooks, 1886, Voy. H.M.S. Challenger, Zool., 16, pp. 58-62, pl. 14, figs. 1, 4, 6, pl. 15, figs. 3-8; Kemp, 1913, Mem. Ind. Mus., 4, pp. 169-71; Gravier, 1937, Ann. Inst. Oceanogr., 17, pp. 205-7, figs. 21-2.

MATERIAL.—Bowen, under rocks, male; Cape Bowling Green, female.

LENGTHS.—Male, 58 mm.; female, 50 mm.

**GONODACTYLUS GLYPTOCERCUS Wood Mason.**

*Gonodactylus glyptocercus* Wood Mason, 1875, Proc. As. Soc. Bengal, p. 232; Wood Mason, 1876, Ann. Mag. Nat. Hist., Ser. 4, 17, p. 263; Kemp, 1913, Mem. Ind. Mus., 4, pp. 186-7; Bigelow, 1931, Bull. Mus. Comp. Zool. Harv., 72, pp. 136-9.

*Protosquilla cerebialis*, Brooks, 1886, Voy. H.M.S. Challenger, Zool., 16, pp. 72-5, pl. 14, figs. 2, 3, pl. 16, figs. 2, 3; Borradaile, 1898, Proc. Zool. Soc. Lond., p. 33, pl. 5, figs. 6a.

*Gonodactylus stoliurus* McNeill, 1926, Austr. Zool., 4, pp. 317-8, fig. 2.

MATERIAL.—Murray Island, female.

LENGTH.—36 mm.

Previous Australian records (McNeill, 1926; Stephenson, 1952) are from the Capricorn Group, where the species is probably abundant.

#### DISCUSSION.

The number of species in the Australian stomatopod fauna is now increased by the additions of *Squilla quinqueidentata*, *S. foveolata*, *Pseudosquilla pilaensis*, and *Odontodactylus scyllarus*, while the doubtful Australian records of *Squilla nepa* are now confirmed. The Queensland fauna is increased by the addition of *Lysiosquilla vercoi*. On the other hand the lists should now omit *L. miersi* which is a synonym of *L. maculata*.

The total known Australian forms now amount to thirty-four species. Of these, twenty have been recorded from Queensland, eight from New South Wales, four from Victoria, one from Tasmania, seven from South Australia, eight from Western Australia, and six from the Northern Territory. The difference in numbers probably reflects different intensities of collecting and recording. These efforts are likely to be roughly comparable only in the eastern mainland States and further comments are restricted to this area.

Of the thirty-four Australian species it appears that twenty-seven have been recorded from extra Australian sources, and seven from Australia only. The following fractions of the fauna from each of the eastern States comprise species not restricted to Australia:—Queensland 21/26, New South Wales 4/8, Victoria 1/4, South Australia 2/7. It may be concluded that the Queensland fauna is dominated by an overflow of Indo-Pacific species. As a corollary, it appears probable that these species are limited in distribution by the colder waters to the South.

Southern Queensland, from the Capricorn Group to the Tweed River, is an area of especial interest with respect to stomatopod distribution. On present data, including some manuscript records, it is the southern limit of eight northern species (*Squilla interrupta*, *S. anomala*, *S. depressa*, *Pseudosquilla ciliata*, *Lysiosquilla maculata*, *Odontodactylus cultrifer*, *Gonodactylus graphurus*, and *G. glyptocercus*). It is also the northern limit of three southern species (*Squilla laevis*, *Lysiosquilla perpasta*, and *L. vercoi*). One is uncertain whether the distributional limits within this comparatively small area are a real indication of faunal boundaries, or whether they reflect more intensive collecting here than elsewhere in Australia. This can be clarified only by a more careful collection of stomatopods from other Australian localities and by the similar treatment of other groups. The general impression gained from a study of the marine fauna as a whole, and such reports as are available from other workers (Hedley, 1904; Clark, 1921; Whitley, 1932; Iredale and Allen, 1940; Clark, 1946; Endean, 1952 in press), indicate that the boundaries are real, and that there is considerable diversity of origin in the elements comprising the marine fauna.



## ACKNOWLEDGMENTS.

I am very grateful to the Director of the Queensland Museum for his kindness in allowing me to examine the collections. Thanks are due also to the Director of the Australian Museum for the loan of specimens of *Lysiosquilla vercoi* and of *Squilla depressa*, and to the Director of the Zoological Survey of India for the loan of a specimen of *S. woodmasoni*. Mr. F. McNeill of the Australian Museum has helped throughout with advice, friendly comments, and by the loan of numerous reprints. I am grateful to Mr. R. K. Bryson of Townsville who forwarded 28 stomatopods from that area.

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## BRACHYURA FROM THE CRETACEOUS OF CENTRAL QUEENSLAND.

JACK T. WOODS.

Queensland Museum.

The material described is from the Tambo Formation of Cretaceous (Upper Albian) age. Most of it was collected near Dartmouth, Central Queensland, in surface nodules of buff argillaceous limestone.

An extended description of *Homolopsis etheridgei* (H. Woodward) (= *Prosopon etheridgei*) is given. The type of this species is in the Queensland Museum, and fourteen examples have been collected near Dartmouth. Two new genera and species are described. The preservation of the material studied is good; the shell is retained in part, and it has been possible to give details of some of the appendages.

Apart from the crabs, the collection from near Dartmouth in the Queensland Museum includes the pelecypod *Aucellina hughendense* (Etheridge), the cephalopods *Nautilus hendersoni* Etheridge Jr., *Aleceras plectoides* (Etheridge Jr.), *Myloceras orbiculus* Whitehouse, *Myloceras* sp., *Labeceras papulatum* Whitehouse, undetermined macrurous decapods and teeth of a shark, *Lamna* sp.

The fossil crabs are all referred to the sub-tribe Dromiacea, the earliest representatives of which are known from the Jurassic of Europe. In the Cretaceous there was an increase in the number of species referable to the Dromiacea and an extension of the geographical range of the group. Other brachyurous groups appeared in this period.

I am indebted to Miss Sanna Shannon who presented collections of these fossils from near Dartmouth to the Queensland Museum (Q.M.) in 1946 and 1949, to Professor W. H. Bryan for the opportunity to study material in the collections of the Department of Geology, University of Queensland (U.Q.) and to Mr. C. C. Morton, Chief Government Geologist, for the loan of material from the collections of the Geological Survey of Queensland (G.S.Q.). I wish to thank Dr. M. F. Glaessner, of the University of Adelaide, for his interest in this work and for the gift of some literature not readily obtainable in Australia.

Sub-tribe **DROMIACEA** De Haan.Family **THELXIOPIDAE** Rathbun.**HOMOLOPSIS ETHERIDGEI** (H. Woodward).

Plate 2, figures 1-3; figure 1.

*Prosopon etheridgei*, H. Woodward, 1892, Proc. Linn. Soc. N.S.W., Ser. 2, 7, p. 301, pl. 4; Etheridge Jr., 1917, Publ. Geol. Surv. Qd, 260, p. 5, pl. 1, figs 1-4.

*Homolopsis etheridgei* (H. Woodward), van Straelen, 1928, Bull. Acad. Belg. Cl. Sci., Ser. 5, 14, p. 619.

**MATERIAL.**—Type, F.2875, Central Queensland (Q.M.). Incomplete cephalothorax and abdomen preserved as extensively eroded shell material and weathered internal mould in buff argillaceous limestone.

F. 2796, F. 2843, F. 2845, F. 2846, F. 2847, F. 2848, 10 miles N. of Dartmouth, Central Queensland (Q.M.); F. 14923, 10 miles N. of Dartmouth, Central Queensland (U.Q.); F. 910, Beaconsfield, Central Queensland (G.S.Q.).

**AGE.**—Tambo Formation, Upper Albian, Cretaceous.

Carapace lengths.—33–51 mm.

Carapace, inflated, ovoid-triangular, longer than broad (ratio 1.14:1); greatest width at one-third of length from posterior; laterally slightly convergent, anteriorly produced, postero-laterally rounded, posteriorly truncated. Regions and lobes well-defined, conspicuously sculptured with granulated prominences; furrows strong. Side-walls strongly reflexed, rounded, with no lateral edge. Linea homolicea extending from extremities of posterior truncation to orbits.

Frontal region with prominent rostrum directed antero-ventrally, slightly elevated at tip, slightly excavated posteriorly, with two short anteriorly directed spines at base. Orbits incomplete, flanked by sharp antennal spine. Gastric region sub-circular, bounded posteriorly by cervical furrow; this furrow bent posteriorly behind hepatic region and uniting with branchio-cardiac furrows. Mesogastric lobe with narrow produced anterior portion, delimited by two furrows passing anteriorly into base of rostrum; ornamented with an elongate anterior, rounded central, and pair of laterally directed prominences. Other paired lobes of gastric region ornamented with line of three prominences on inner margin and irregular elevations laterally. Hepatic region dorso-laterally with three spinous prominences, one forming antero-lateral angle; ventro-lateral development strong, smooth. Urogastric region separated by deep furrow from cardiac and branchial regions; divided medianly.

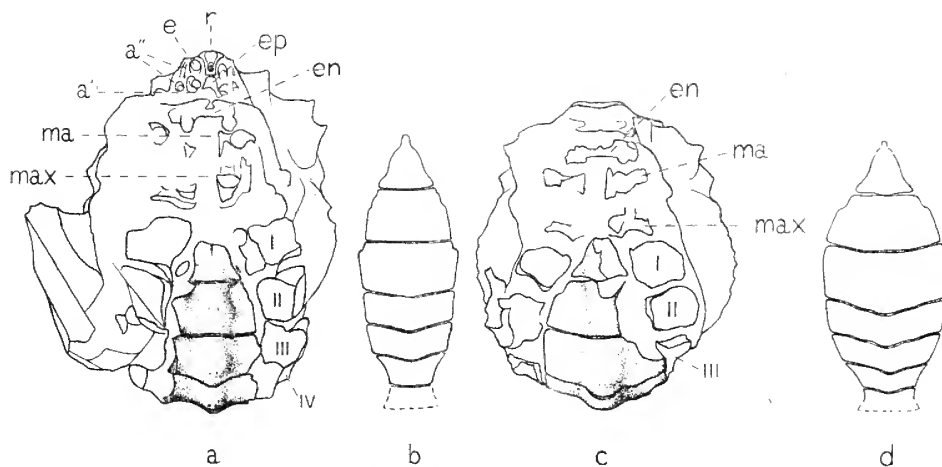


Figure 1. *Homolopsis etheridgei* (H. Woodward).

a. Male, ventral view of cephalothorax with attached abdomen, F. 2843 (Q.M.). b. Male, abdomen restored from several specimens. c. Female, ventral view of cephalothorax, with attached abdomen, F. 910 (G.S.Q.). d. Female, abdomen restored from several specimens. All natural size.

r., rostrum; ep., epistome; en., endostome; e., eyestalk; a', antennule; a'', antenna; ma., mandible; max., third maxilliped; I-IV, coxae of pereopods.

Branchio-cardiac furrows strong, curved, posteriorly converging behind cardiac region, then sharply diverging, continuing around ventro-lateral margin and delimiting a flange bordering sternal surface; branchio-cardiac furrows anteriorly joining cervical, ventrally separating hepatic and narrow pterygostomian regions and joining furrow separating hepatic and gastric regions. Cardiac region inflated, pentagonal, posteriorly acute, ornamented with some small irregularly dispersed granules. Antero-branchial lobes inflated, circumscribed by furrows; mesobranchial lobes with smaller inner and larger irregular outer prominence; epibranchial lobes with irregular tubercles. Postero-branchial lobes large, conspicuously ornamented dorsally with numerous irregularly dispersed rounded tubercles, becoming smooth ventro-laterally. Intestinal region low, smooth.

Abdomen of seven segments, attached dorsally, incompletely folded beneath cephalothorax; no trace of vestigial uropods. Leaf-shaped in male, greatest width at fifth segment, about one-third that of carapace; telson small, triangular, with longitudinal depression towards tip; median longitudinal ridge with elevations bearing two granules transversely and flanked by depressions on tergal surface of second to sixth segments. Female abdomen wider, width half that of carapace; sculpture less pronounced than in male.

Eyestalks stouter than antennae and antennules, not concealed by orbits; basal antennular joint enlarged. Epistome small, triangular, in contact with process from under rostrum; separated by strong ridge from endostome. Buccal frame quadrate; third maxillipeds sub-operculiform.

Chelipeds equal, granulated especially on outer surface, shorter than second and third pereopods; arm as long as hand, expanded at attachment of wrist; hand and wrist short, thick; palm longer than fingers. An oblique oval tubercle adjacent to inner side of each coxa. Chelipeds disproportionately larger in largest males. Third pereopod longer, stouter than second; merus in each sub-circular, compressed, with longitudinal groove on postero-lateral surface, crenulated and granulated dorsally and ventrally. Fourth reduced, sub-dorsal in attachment; merus grooved and crenulated as in third, but reduced by half. Fifth dorsal in attachment, further reduced, but length of curved, slightly crenulated merus little less than that of fourth; dactylus short, hooked.

Surface of carapace, abdomen and appendages punctate.

*Homolopsis etheridgei* is the most abundant of the Cretaceous crabs so far obtained in Queensland. It is closest to the type of the genus, *H. edwardsi* Bell (1863), from the Albian of England, from which it differs in the more strongly sculptured carapace, delineation of the cardiac region, more produced anterior, and the elliptical rather than quadrate transverse section. In *H. etheridgei* the ornament is independent of carapace size, whereas specimens of *H. edwardsi* show some variation in this respect (Carter, 1898).

Recent thelxiopids are in the main deep-water forms, often taken at depths between 100 and 1,000 fathoms (Alcock, 1901). The marine Cretaceous deposits of Central and Western Queensland were laid down in a shallow epicontinental sea. It would appear that the thelxiopids were among the crabs replaced in shallow waters by groups which developed during the Cretaceous.

#### Family PROSOPONIDAE von Meyer.

##### DIORATIOPUS gen. nov.

Carapace pentagonal, longer than wide, biconvex, anteriorly produced, sides subparallel; well differentiated; cervical and branchio-cardiac furrows equal; side-wall near vertical, with a prominent lateral line.

Rostrum short, triangular, anteriorly directed; orbits incomplete, orbital depressions wide, shallow. Fourth and fifth pereopods reduced.

GENOTYPE.—*Dioratiopus salebrosus* sp. nov.

**DIORATIOPUS SALEBROSUS** sp. nov.

Plate 2, figures 4-5; figure 2.

**MATERIAL.**—Type, F.14927, 10 miles N. of Dartmouth, Central Queensland (U.Q.). Female, carapace preserved as external and internal moulds, shell material largely lost, pereopods partially preserved.

F.14928, 10 miles N. of Dartmouth, Central Queensland (U.Q.).

**AGE.**—Tambo Formation, Upper Albian, Cretaceous.

Carapace lengths.—Type, 24.3 mm.; young individual (without rostrum), 10.3 mm.

Carapace pentagonal, longer than broad (ratio 1.13 : 1), equally convex longitudinally and transversely; anteriorly produced, sides straight, subparallel; postero-laterally rounded; posteriorly straight. Regions and lobes moderately well delimited, not strongly sculptured, ornamented with sharp granules; furrows equal, distinct. Side-walls near vertical, gently reflexed, no lateral edge. Lateral line of least calcification crossing the side-wall and passing ventrally to sub-orbital surface.

Frontal region with blunt, broadly triangular rostrum, anteriorly directed, slightly excavated posteriorly, with two small elevations towards base. Orbits incomplete; depressions for eyes wide, smooth, shallow, somewhat backwardly directed, extending to antero-lateral angle. Lower border entire, sharp; upper border smooth, concave between blunt inner and sharp outer supra-orbital spines. Gastric region bordered posteriorly by broadly V-shaped cervical furrow; cervical furrow vertical on side-wall posterior to hepatic region and united with branchio-cardiac furrows. Mesogastric lobe with narrow produced anterior portion, delimited by two furrows passing anteriorly into base of rostrum. Hepatic region small, separated from gastric by slight depression. Urogastric region lunate; bordered posteriorly by furrow partially filled with granules medially, and fading laterally before reaching cervical furrow.

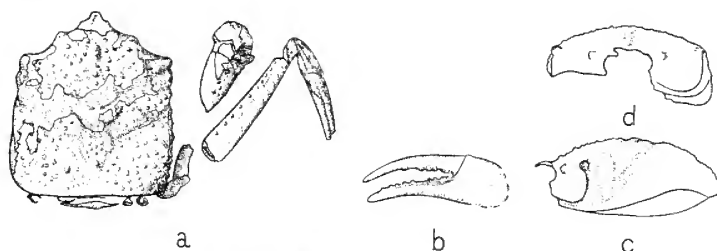


Figure 2. *Dioratiopus salebrosus* gen. et sp. nov. Type.

a. Dorsal view. b. Left side of hand and fingers of right cheliped. c. Left side of carapace showing line of least calcification. d. Anterior view of carapace. All natural size.

Branchio-cardiac furrows posteriorly weak, curved; laterally stronger, straight; anteriorly joining cervical and bordering hepatic region ventro-laterally. Cardiac region pentagonal, slightly elevated. Antero-branchial lobes subdivided by two transverse furrows. Postero-branchial lobes large, less granulated laterally; each with a small elevation adjacent to cardiac region. Intestinal region not delineated.

Abdomen of female large; sides subparallel; greatest width at fifth segment, almost three-fifths that of carapace; median longitudinal ridge with narrow transverse elevation on tergal surface of second to fifth segments.

Buccal frame quadrate.



Chelipeds not robust ; shorter and stouter than second and third pereopods ; arm rounded triangular in section, with sharp granules on edges, very spinous at attachment of wrist. Plane of hand slightly incurved ; hand longer than arm ; fingers dentate, distally slightly ventrally curved, longer than palm. Second and third pereopods equal ; merus in each compressed, with longitudinal groove on postero-lateral surface, armed with spinous granules dorsally and ventrally. Carpus of second short, angular ; propodus long, tapering, slightly curved, grooved. Oviduct opening on coxa of third pereopod. Fourth reduced, attached at extremity of straight posterior of carapace. Fifth further reduced, very slender, dorsal in attachment.

Carapace, abdomen and appendages non-punctate.

*Dioratiopus* is readily distinguished from other prosoponid genera by the combination of such characteristics as the pentagonal outline, the near vertical side-wall with the prominent lateral line, the anteriorly directed rostrum and the wide, shallow orbital depressions. The position of the line of least calcification suggests it is homologous with the linea dromiida of the Dromiidae. The carapace of the young individual has broken away along the line confirming that its function was connected with moulting. *Dioratiopus* appears to be the first prosoponid genus in which the lateral line and the position of the oviduct opening have been described.

#### **TORYNOMMA** gen. nov.

Carapace sub-quadrate, equidimensional, biconvex ; well differentiated ; furrows equal, cervical sinuous laterally ; side-wall vertical, with lateral line at base.

Rostrum narrow, antero-ventrally directed ; orbits incomplete, orbital depressions moderately deep, lower border sharp, produced. Anterior projection of epimeral attractor muscle furrows deep. Cardiac region short, with three posterior projections.

Chelipeds robust ; fourth pereopods reduced ; fifth extremely reduced, set close to mid-line of carapace.

GENOTYPE.—*Torynomma quadrata* sp. nov.

#### **TORYNOMMA QUADRATA** sp. nov.

Plate 2, figures 6-7 ; figure 3.

MATERIAL.—Type, F.2877, 10 miles N. of Dartmouth, Central Queensland (Q.M.). Nearly complete carapace, with broken pereopods.

F. 2878, F. 2879, F. 2880, F. 2881, 10 miles N. of Dartmouth, Central Queensland (Q.M.). F. 14924, F. 14926, 10 miles N. of Dartmouth, Central Queensland (U.Q.).

AGE.—Tambo Formation, Upper Albian, Cretaceous.

Carapace lengths.—Type, 20.6 mm. ; other specimens, 17.5-22.0 mm.

Carapace sub-quadrate, equidimensional, convex longitudinally, less so transversely ; anteriorly not produced, sinuous ; sides slightly curved ; postero-laterally rounded ; posteriorly almost straight. Regions and lobes moderately well delimited, ornamented with tubercles and fine granules ; furrows equal, distinct but not deeply impressed. Side-walls vertical, no lateral edge ; lateral line of least calcification at base.



Frontal region with narrow medianly furrowed rostrum, almost ventrally directed. Orbits incomplete, depressions for eyes wide, smooth, moderately deep, laterally directed, extending to antero-lateral angle. Lower border sharp, produced as tooth-like process extending beyond upper border; latter smooth, concave between blunt inner and sharp outer supra-orbital spines, projecting anteriorly almost to level of rostrum. Gastric region bordered posteriorly by cervical furrow with arms sinuously curved, uniting with branchio-cardiac furrows low on side-wall. Mesogastric lobe slightly elevated posteriorly, divided by median depression; narrowly produced anteriorly, delimited by two furrows confluent with continuation of rostral furrow which separates slightly elevated epigastric lobes. Protogastric lobes large, each with small tubercle. Hepatic region small, ornamented with three granules posterior to outer supra-orbital spine; not distinctly separated from protogastric lobes. Urogastric region separated from cardiac region by furrow; incompletely delimited from antero-branchial lobes.

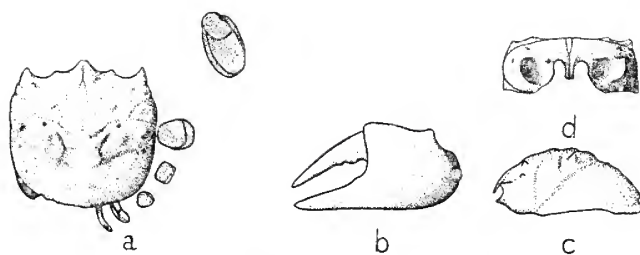


Figure 3. *Torynomma quadrata* gon. et sp. nov.

a. Dorsal view of type; last two pereopods have been pushed upwards and the true posterior of carapace is obscured by matrix. b. Left side of hand and fingers of left cheliped based on F. 14924 (U.Q.). c. Left side of carapace of type, apparently broken along line of least calcification. d. Anterior view of carapace, F. 2880 (Q.M.). All natural size.

Branchio-cardiac furrows laterally distinct, straight; posteriorly weak. Cardiac region broad, with three posterior projections (seen especially in decorticated specimens). Two deeply incised furrows lateral to cardiac and urogastric regions marking attachment of anterior part of epimeral attractor muscle. Antero-branchial lobes subdivided by oblique furrow; epibranchial lobes small, not sculptured; mesobranchial lobes with two large granulated tubercles. Postero-branchial lobes slightly inflated; more coarsely granulated than remainder of carapace; separated by depressed area from broad intestinal region, posteriorly bordered by smooth rim.

Abdomen in male small, sides subparallel, with greatest width about three-eighths that of carapace; constricted to about one-quarter width of carapace at attachment.

Thoracic sternites in male deeply excavated for reception of abdomen; sutures oblique.

Chelipeds equal, relatively large, strong; arm shorter than carapace, expanded distally, triangular in section, granulated on edges; wrist inflated with three dorsal rows of tubercles and five granulations between rows; hand slightly longer than carapace, smooth, with large dorsal tubercle near carpal articulation; movable finger with blunt proximal tooth, shorter than palm. Second and third pereopods slightly longer than chelipeds; merus in each laterally compressed, finely granulated on edges; carpus short, angular, with dorsal keel; propodus angular, longer, tapering. Oviduct opening on postero-internal angle of coxa of third pereopod. Fourth pereopods reduced. Fifth pereopods very slender, attached close to mid-line of carapace.

Surface of carapace, abdomen and appendages non-punctate.

An analysis of the morphology indicates that while these new prosoponid genera *Torynomma* and *Dioratiopus* differ greatly in appearance, structurally they have much in common. *Torynomma* bears some superficial resemblance to *Mithracites* Gould from the Lower Aptian of England, but exhibits important differences in the structure of the rostrum, the side-wall, and in the reduction of the last two pairs of legs.

The relatively deep impression of the furrows in *T. quadrata*, marking the position of attachment of the anteriorly projecting part of the epimeral attractor muscle, may be correlated with the reduction of the abdomen. Glaessner (1933) recognised the significance of these longitudinal depressions. A similar condition exists in the fossil dromiacean, *Dakoticancer overana* Rathbun (1917), from the Upper Cretaceous of South Dakota, U.S.A.

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## EXPLANATION OF PLATE 2.

*Homolopsis etheridgei* (H. Woodward).

- Fig. 1. Dorsal view of carapace ; type, F. 2875 (Q.M.).  
Fig. 2. Right side of undistorted carapace ; F. 2796 (Q.M.).  
Fig. 3. Anterior view of carapace showing rostrum, incomplete orbits, and broken segments of eyestalk, antenna and antennule ; F. 2847 (Q.M.).

*Dioratiopus salebrosus* gen. et sp. nov.

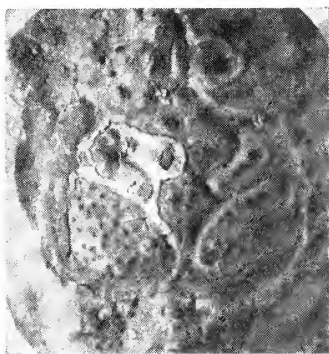
- Fig. 4. Dorsal view of carapace with broken pereopods ; type, F. 14927 (U.Q.).  
Fig. 5. Dorsal view of carapace of young individual ; F. 14928 (U.Q.).

*Torgnomma quadrata* gen. et sp. nov.

- Fig. 6. Dorsal view of carapace with broken pereopods ; type, F. 2877 (Q.M.).  
Fig. 7. Dorsal view of carapace with chelipeds ; F. 14924 (U.Q.).

All natural size ; specimens from Tambo Formation, Upper Albian.

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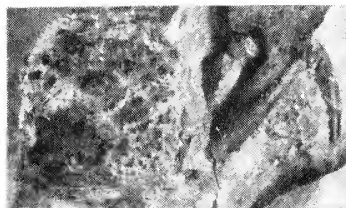
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## DE VIS' TYPES OF AUSTRALIAN SNAKES.

GEORGE MACK AND S. B. GUNN.

Queensland Museum.

C. W. De Vis was Curator of the Queensland Museum from 1882 to 1910. During this period he described a wide range of vertebrate material, both fossil and recent, and many of his new forms have provided difficulties for other workers.

He described 22 forms of Australian snakes, and the types or probable types of all but one are in the collections of this Museum. Over the years, some of his names have been consigned to synonymy, while others have remained doubtful. The type material has now been examined and re-determined by us. Only three of the 22 forms named by De Vis are considered valid. They are *Pseudechis guttatus*, *Rhynchoelaps warro* and *Tropidechis dunensis*.

A complete list follows showing the present status of the various forms. Necessary corrections to the original descriptions are given with De Vis' statement in each instance in parenthesis.

As little has been recorded of the distribution of snakes in Queensland, information on the range of most species, based on material collected within the State, is included.

NEOSPADES KENTII De Vis. = **MYRON RICHARDSONII** Gray.

*Myron richardsonii* Gray, Cat. Snakes Coll. Brit. Mus., 1849, p. 70.

*Neospades kentii* De Vis, Proc. Roy. Soc. Qd, 6, 1889, p. 238 (Cambridge Gulf, North-western Australia).

Corrections to original description of *Neospades kentii* De Vis. Type, No. J. 681 Queensland Museum.

The nostrils are dorsal; temporals 1+2 left and 2+2 right (3); sixth upper labial largest on left, eighth largest on right (sixth); ventrals 136 (138); subcaudal 34 paired, 7 partially divided. The number of subcaudals was omitted by De Vis.

Although described as a new genus and species, *Neospades kentii* De Vis is clearly a synonym of *Myron richardsonii* Gray. This was noted by Boulenger (1896, p. 20).

The species is not represented from Queensland localities in the collections.

DISTIRA NASALIS De Vis = **HYDROPHIS MAJOR** (Shaw).

*Hydrus major* Shaw, Gen. Zool., 3, 1802, p. 558, pl. 124.

*Distira nasalis* De Vis, Ann. Qd Mus., 6, 1905, p. 48 (Queensland Coast).

Corrections to original description of *Distira nasalis* De Vis. Type, No. J. 203 Queensland Museum.



De Vis described the infero-posterior angle of the nasal as divided from the remainder of the nasal by grooves from the nostril to the prefrontal and second labial. This is the condition on the right side, but there is no groove to the prefrontal on the left side. Anterior temporals 2 (1); upper labials 7 (6); body scales in 39 rows (37).

The type of *Distira nasalis* De Vis is a specimen of *Hydrophis major* (Shaw). Longman (1918, p. 42) noted this, and remarked upon most of the above corrections to the original description.

De Vis' type is the only Queensland specimen in the collections.

DENISONIA FENESTRATA De Vis = **GLYPHODON TRISTIS** Günther.

*Glyphodon tristis* Günth., Cat. Colubr. Snakes Brit. Mus., 1858, p. 211.

*Denisonia fenestrata* De Vis, Ann. Qd Mus., 6, 1905, p. 50 (Queensland).

De Vis made use of two specimens in his description of *D. fenestrata*, but there is only one labelled as the type (J. 200) in the collections. It is recorded as from Cape York, North Queensland.

This specimen, which is in good condition, has the characteristically small eye of *Glyphodon* with diameter less than its distance from the mouth; rostral broader than deep, just visible from above; internasals slightly less than half as long as prefrontals; nasal divided, widely separated from the single preocular; frontal one-fifth longer than broad, as long as its distance from the tip of the snout, shorter than the parietals, two and a half times broader than the supraoculars; postoculars 2; temporals 2 + 2, lower anterior wedged between fifth and sixth upper labials; 6 upper labials, third and fourth entering the orbit; chin shields equal, anterior in touch with 4 lower labials. Body scales in 17 rows; ventrals, 169; subcaudals, 28 pairs; anal divided.

*Denisonia fenestrata* De Vis is a synonym of *Glyphodon tristis* Günther. This was noted by Longman (1912, p. 23).

It would appear that this species is confined to Cape York Peninsula in Australia. The only other Australian specimen in the collections is from Cape York. There are three from New Guinea, but the precise localities are not known.

DENISONIA BANCROFTI De Vis = **ASPIDOMORPHUS DIADEMA** (Schlegel).

*Calamaria diadema* Schleg., Phys. Serp., 2, 1837, p. 32.

*Denisonia bancrofti* De Vis, Ann. Qd Mus., 10, 1911, p. 23 (Stannary Hills, Atherton Tableland, North-east Queensland).

Corrections to original description of *Denisonia bancrofti* De Vis. Type, No. J. 195 Queensland Museum.

Frontal twice as broad as the supraoculars (3 times), and as long as its distance from the snout (shorter); ventrals 196 (185); subcaudals 35 pairs (33 pairs); anal divided (entire).

A constant feature of *A. diadema* is the presence of a band of red on the nape. This varies slightly in size and position. In preserved specimens the red colour is lost and the band appears lighter than the remainder of the dorsal surface. In the type of *D. bancrofti* it extends over the posterior part of the parietals and four rows of nuchal scales.

The specimen upon which De Vis based his *Denisonia bancrofti* is clearly an example of *Aspidomorphus diadema* (Schlegel).

Specimens of *Aspidomorphus diadema* have been collected in Queensland from Wenlock, Cape York Peninsula in the north, to the southern border of the State and west to Longreach. It is seldom that specimens exceed 300mm. in length, but a few examples measuring up to 500mm. have been obtained.

BRACHYSOMA SUTHERLANDI De Vis = **DEMANSIA NUCHALIS** (Günther).

*Pseudonaja nuchalis* Günth., Cat. Colubr. Snakes Brit. Mus., 1858, p. 227.

*Brachysoma sutherlandi* De Vis, Proc. Roy. Soc. Qd, 1, 1884, p. 139 (Carl Creek, Norman River, North Queensland).

Corrections to original description of *Brachysoma sutherlandi* De Vis. Type, No. J. 190 Queensland Museum.

Ventrals 162 (160); subcaudals 45 (40).

Longman (1912, p. 24) noted that *B. sutherlandi* probably was based on a juvenile specimen of the genus *Demansia*, and Fry (1914, p. 192) doubtfully included the name in the synonymy of *Demansia modesta* (Günther). It is clear, however, that *B. sutherlandi* is a synonym of *Demansia nuchalis* (Günther).

The series of *D. nuchalis* in the collections shows that the species is commonly present throughout Queensland west of the Main Divide and south of Cape York Peninsula. In the eastern coastal areas, there are records from Eidsvold, Lowood and Stradbroke Island, south-east Queensland.

PSEUDELAPS BANCROFTI De Vis = **DEMANSIA NUCHALIS** (Günther).

*Pseudonaja nuchalis* Günth., Cat. Colubr. Snakes Brit. Mus., 1858, p. 227.

*Pseudolaps bancrofti* De Vis, Ann. Qd Mus., 10, 1911, p. 25 (Stannary Hills, Atherton Tableland, North-east Queensland).

Corrections to original description of *Pseudelaps bancrofti* De Vis. Type, No. J. 187 Queensland Museum.

Ventrals 195 (188); subcaudals 61 pairs (59).

Longman (1912, p. 24) noted the affinities of *P. bancrofti* and *D. nuchalis*, and Fry (1914, p. 195) included De Vis' name in the synonymy of *D. nuchalis*.

HOPLOCEPHALUS VESTIGIATUS De Vis = **DEMANSIA OLIVACEA** (Gray).

*Lycodon olivaceus* Gray, Zool. Miscell., 1842, p. 54.

*Hoplocephalus vestigiatus* De Vis, Proc. Roy. Soc. Qd, 1, 1884, p. 138 (unknown locality).

Corrections to original description of *Hoplocephalus vestigiatus* De Vis. Type, No. J. 206 Queensland Museum.

Ventrals 182 (152); second upper labial barely reaches anterior ocular (third upper labial).

Boulenger (1896, p. 335) doubtfully included *Hoplocephalus vestigiatus* in the synonymy of *Denisonia superba*, a species which does not occur in Queensland. De Vis' type agrees in all respect with *Demansia olivacea* (Gray).

In Queensland, *D. olivacea* occurs in the northern and eastern coastal areas. Julia Creek, near Cloncurry, is the farthest inland record in the north, and Noosa Heads, about 100 miles north of Brisbane, is the most southerly record in the east.

PSEUDECHIS MORTONENSIS De Vis = **PSEUDECHIS GUTTATUS** De Vis.

*Pseudechis guttata* De Vis, Ann. Qd Mus., 6, 1905, p. 49 (Cecil Plains, South Queensland).

*Pseudechis mortonensis* De Vis, Ann. Qd Mus., 10, 1911, p. 24 (Brisbane, South-east Queensland).

Corrections to original description of *Pseudechis guttatus* De Vis. Type, No. J. 189 Queensland Museum.

Diameter of eye equal to distance from mouth (diameter of eye greater); portion of rostral visible from above equal to one-third its distance from frontal (less than one-third); width of frontal slightly greater than supraoculars (equal to width of supraoculars); right anterior chin shield in touch with three lower labials (four); ventrals 186 (181); subcaudals 40 single, 11 paired (39 single, 11 paired).

Corrections to original description of *Pseudechis mortonensis* De Vis, based on a specimen labelled doubtfully as the type (J. 207).

Rostral two-thirds broader than deep (one-fourth); subcaudals 32 single, 28 paired (22 single, 38 paired); length of tail 200mm. (20mm.).

The need for these alterations was noted by Longman (1912, p. 24). The differences in numbers of single and paired subcaudals, and the length of tail could be errors in printing.

The following variations have been noted in 20 adult specimens, 5 previously labelled *mortonensis* and 15 *guttatus*.

EYE.—Vertical diameter of eye varies from equal to its distance from the mouth to being contained one and a half times in the distance from the mouth.

ROSTRAL.—Portion of the rostral visible from above equal to one-third its distance from the frontal, except in one specimen in which it is two-fifths this distance.

FRONTAL.—Frontal is one-eighth wider than the supraoculars in all with one exception in which the frontal is one-eighth less than the width of the supraoculars.

NASALS.—The nasals may be divided or semidivided ; in some specimens they are divided on one side and semidivided on the other.

CHIN SHIELDS.—Anterior and posterior shields equal in length, or the posterior slightly longer than the anterior. Three lower labials in contact with anterior chin shields, except in one specimen in which four labials are in contact with the left anterior shields.

TEMPORALS.—Temporals  $2 + 2$  ; in one specimen  $2 + 0$ .

SCALE COUNTS.—Rows of scales in all specimens number 19 ; ventrals 186-196; subcaudals 49-61, the majority of them single, but one has an equal number of single and paired subcaudals, and two have the majority paired ; the anal in all specimens is divided.

COLOUR.—*P. mortonensis* was described as black with bluish lead-grey ventrals. In all specimens examined, however, including the doubtful type, there are some lighter, cream-grey dorsal patches, and the ventrals are flecked with cream and darker grey. In specimens originally determined as *P. guttatus*, the lighter dorsal patches are more numerous, giving an overall cream-grey appearance in some specimens. The ventrals are either uniformly grey or cream-grey. This applies to all with the exception of one specimen recently collected at Ballandean on the Main Divide, south Queensland. This example is olive-brown above, uniform on the head, but with each body scale lighter in the centre. The ventrals are cream-grey, mottled with dark grey on the margins.

On the whole, specimens from coastal localities are darker and more uniform in colour than those from west of the Main Divide, but there are no grounds for maintaining *P. mortonensis* and *P. guttatus* as separate species.

Specimens of *P. guttatus* as here defined have been obtained in Queensland only from the south-eastern area, west to Glenmorgan and north to Bundaberg.

PSEUDECHIS WILESMITHII De Vis = **OXYURANUS SCUTELLATUS** (Peters).

*Pseudechis scutellatus* Peters, Mber. preuss. Akad. Wiss., 1867, p. 710.

*Pseudechis wilesmithii* De Vis, Ann Qd Mus., 10, 1911, p. 24 (Walsh River, Cape York Pen., North Queensland).

Corrections to original description of *Pseudechis wilesmithii* De Vis. Type, No. J. 201 Queensland Museum.

Rostral one-third broader than deep (one-fourth longer than broad); frontal one and a half times as long as broad (more than one and a half times as long as broad); 2 preoculars on left, 1 on right (2 preoculars); 6 upper labials (7), but the lower anterior temporal reaches the margin and appears as an extra labial on the left; 3 lower labials are in touch with the anterior chin shields (2); subcaudals 71 pairs (63 pairs). The tail is incomplete.

Longman (1913, p. 24) noted the need for most of these corrections and recorded De Vis' type as being closely allied to *Pseudechis scutellatus* Peters. The type of *Pseudechis wilesmithii* De Vis is clearly a specimen of *Oxyuranus scutellatus* (Peters).

Although the specimen which Peters described in 1867 as *Pseudechis scutellatus* was collected at Rockhampton, mid-eastern Queensland, the species does not appear to have been subsequently recognised in Australia until a specimen exceeding nine feet in length was collected by W. McLennan near Coen, Cape York Peninsula in 1922. This was described by Kinghorn (1923, p. 42) as a new genus and species, *Oxyuranus macleannani*. Thomson (1933, p. 855), who had obtained additional material from Cape York Peninsula, showed that Kinghorn's new form had been described from an example of *Pseudechis scutellatus* Peters. However, the generic characters described by Kinghorn, especially some features of the skull, are worthy of recognition and *Oxyuranus* has been retained.

During the last twenty years, under the vernacular name of Taipan, the species has received much unwarranted public attention in Queensland. It is one of the largest of venomous snakes, and therefore potentially dangerous from the human point of view, but it is neither so numerous nor so widespread as one or two more dangerous forms; for example, the Brown Snake, *Demansia textilis*. Specimens of *D. textilis* are usually highly nervous and strike without provocation, whereas McLennan rode his horse over the large example of *O. scutellatus* which he collected near Coen.

It is not generally known that the range of *O. scutellatus* in eastern Queensland extends considerably to the south of Cape York Peninsula. In the collections of this Museum there is a specimen from Colosseum, about 230 miles north of Brisbane, which was received in 1922. There are other specimens from near Rockhampton, Townsville and Watalgan, mid-east Queensland, and during the last two years a number has been received from the vicinity of Gympie, about 90 miles north of Brisbane.

There is no doubt that the species has always been present at least as far south as Gympie, but specimens have not previously been submitted for determination.

DENISONIA NIGRA De Vis = **DENISONIA CORONOIDES** (Günther).

*Hoplocephalus coronoides* Günth., Cat. Colubr. Snakes Brit. Mus., 1858, p. 215.

*Denisonia nigra* De Vis, Ann. Qd Mus., 6, 1905, p. 50 (Tasmania).

Corrections to original description of *Denisonia nigra* De Vis. Type, No. J. 196 Queensland Museum.

Frontal twice as long as broad (one and two-thirds as broad as long); ventrals 141 (126).

The specimen from which *Denisonia nigra* De Vis was described is a dark coloured example of *Denisonia coronoides* (Günth). This species does not occur as far north as Queensland; De Vis' type is from Tasmania.



DENISONIA FRONTALIS var. PROPINQUA De Vis = **DENISONIA SUTA** (Peters).

*Hoplocephalus sutus* Peters. Mber. preuss. Akad. Wiss., 1863, p. 234.

*Denisonia frontalis* var. *propinqua* De Vis, Ann. Qd Mus., 6, 1905, p. 51 (Queensland)

Corrections to original descriptions of *Denisonia frontalis* var. *propinqua* De Vis. Type, No. J. 198 Queensland Museum.

Frontal almost twice as long as broad (one-third longer than broad); ventrals 172 (161).

Both *Denisonia frontalis* Ogilby and *D. frontalis* var. *propinqua* De Vis are based on specimens of *Denisonia suta* (Peters). This was noted by Kinghorn (1920, p. 110).

From the material in the collections it would appear that *D. suta* occurs in Queensland on and west of the Main Divide south of Cape York Peninsula.

HOPLOCEPHALUS ORNATUS De Vis = **DENISONIA MACULATA** (Steindachner).

*Hoplocephalus maculatus* Steind., Novara Rept., 1867, p. 81.

*Hoplocephalus ornatus* De Vis, Proc. Roy. Soc. Qd, 1, 1884, p. 100, pl. 15 (Surat, inland South Queensland).

Correction to original description of *Hoplocephalus ornatus* De Vis. Type, No. J. 199 Queensland Museum.

Third and fourth upper labials enter the orbit (fourth and fifth).

There is a marked difference in colour between specimens of *D. maculata* from west of the Main Divide in eastern Australia and those from coastal areas. The former are banded, the latter are not banded.

Steindachner's material came from New South Wales, presumably the coastal area, for his description is that of a non-banded specimen. The type of *H. ornatus* De Vis, however, is from Surat, inland Queensland, and it is banded.

Boulenger (1896, p. 341) noted the structural similarity, but hesitated to include *H. ornatus* in the synonymy of *D. maculata* because of the marked colour difference. Later, Waite and Longman (1920, p. 178) described what they termed a new variety, *Denisonia maculata* var. *devisi*, from six specimens, including De Vis' type and five others, three from localities west of the Main Divide, and two lacking any particulars. This is De Vis' *Hoplocephalus ornatus*.

Although these inland and coastal forms would appear to represent good subspecies, it is yet too early to attempt subspecific differentiation of Australian snakes. When a name is required for the banded form, *devisi* Waite and Longman will have to be used; *Denisonia ornata* (De Vis) is preoccupied by *Denisonia ornata* Krefft described from a coastal non-banded specimen.



The banded form of *D. maculata* is represented in the collections by specimens from localities throughout Queensland west of the Main Divide and south of Cape York Peninsula and the northern coastal areas. Non-banded specimens have been obtained from the eastern coastal area from the vicinity of Rockhampton south to the Dawson Valley.

*Denisonia fasciata* Rosen (1905, p. 179), described from two specimens collected in south-western Australia, would appear to be conspecific with the banded form of *Denisonia maculata* (Steind.).

HOPLOCEPHALUS SULCANS De Vis = **HOPLOCEPHALUS BITORQUATUS** (Jan).

*Alecto bitorquata* Jan, Rev. Mag. Zool., 2nd ser., 11, 1859, p. 128.

*Hoplocephalus sulcans* De Vis, Proc. Roy. Soc. Qd, 1, 1884, p. 138 (Mitchell, inland South Queensland).

The specimen from which *Hoplocephalus sulcans* De Vis was described is missing from the collections, but the original description is unmistakably that of a specimen of *Hoplocephalus bitorquatus* (Jan). This was recognised by Boulenger (1896, p. 349).

*H. bitorquatus* has the head broad, distinct from the neck, and the ventrals are keeled. Scale counts vary from 19 to 21 rows. A distinctive characteristic of the species is the colour pattern of the head. This is constant, and De Vis was at pains to describe it under three different names.

Queensland examples of *H. bitorquatus* in the collections are from numerous localities in the south-eastern quarter of the State, extending from the vicinity of Clermont and Rockhampton to the southern border and west to Surat.

DENISONIA ANGULATA De Vis = **HOPLOCEPHALUS BITORQUATUS** (Jan).

*Alecto bitorquata* Jan, Rev. Mag. Zool., 2nd ser., 11, 1859, p. 128.

*Denisonia angulata* De Vis, Ann. Qd Mus., 6, 1905, p. 51 (Queensland).

Corrections to original description of *Denisonia angulata* De Vis. Type, No. J. 194 Queensland Museum.

Scales in 19 rows (17); ventrals 198 (186); subcaudals 47 (46).

The broad head with distinctive colour pattern, keeled ventrals, and scale counts characteristic of *Hoplocephalus bitorquatus* are evident in the type of *Denisonia angulata*.

DENISONIA REVELATA De Vis = **HOPLOCEPHALUS BITORQUATUS** (Jan).

*Alecto bitorquata* Jan. Rev. Mag. Zool., 2nd ser., 11 1859, p. 128.

*Denisonia revelata* De Vis, Ann. Qd Mus., 10, 1911, p. 22 (Stannary Hills, Atherton Tableland, North-east Queensland).

Corrections to original description of *Denisonia revelata* De Vis. Type, No. J. 2957 Queensland Museum.

Temporals 2+2 (1+2); subcaudals 48 (50); scales in 19 rows.

The type of *Denisonia revelata* in the third characteristic example of *Hoplocephalus bitorquatus* described by De Vis as a new species.

FURINA ROBUSTA De Vis = **RHYNCHOELAPS BERTHOLDI** (Jan).

*Elaps bertholdi* Jan, Rev. Mag. Zool., 2nd ser., 11, 1859, p. 123.

*Furina robusta* De Vis, Ann. Qd Mus., 6, 1905, p. 51 (Coolgardie, inland Western Australia).

Corrections to original description of *Furina robusta* De Vis. Type, No. J. 205 Queensland Museum.

Frontal longer than its distance from the snout (shorter); ventrals 132 (135).

The type of *Furina robusta* De Vis from Coolgardie, inland Western Australia, is a typical example of *Rhynchoelaps bertholdi* (Jan). The colour pattern characteristic of *bertholdi* is still evident in the type.

DENISONIA ROSTRALIS De Vis = **RHYNCHOELAPS WARRO** (De Vis).

Figures 1 and 2.

*Cacophis warro* De Vis, Proc. Roy. Soc. Qd. 1, 1884, p. 139 (Warro Station, Port Curtis, Mid-east Queensland).

*Denisonia rostralis* De Vis, Ann. Qd Mus., 10, 1911, p. 23 (Stannary Hills, Atherton Tableland, North-east Queensland).

*Rhynchoelaps fuscicollis* Lonnberg and Andersson, Kungl. K. svenska Vetensk. Akad. Handl., 52, 7, 1915, p. 9 (Cairns, North-east Queensland).

Corrections to original description of *Cacophis warro* De Vis. Type, No. J. 188 Queensland Museum.

Prefrontal in contact with second and third upper labials (with third and fourth upper labials); third upper labial and preocular form anterior edge of orbit (fourth upper labial and preocular).

Corrections to original description of *Denisonia rostralis* De Vis. Type, No. J. 193 Queensland Museum.

Eye distant from mouth one and a third times its diameter (once its diameter); frontal one and a half times as long as broad (nearly twice as long as broad); ventrals 141 (140); anal divided (entire).

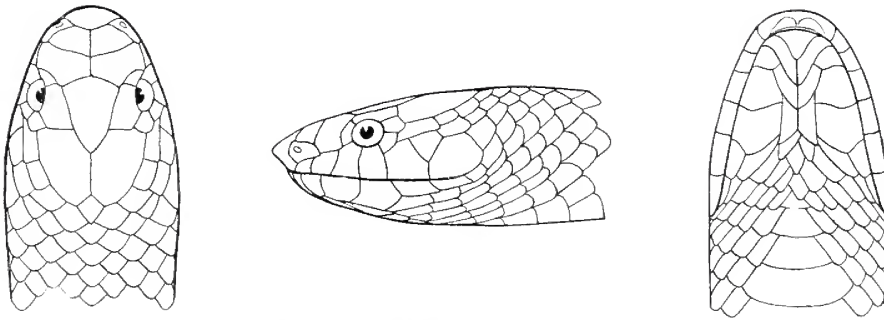


Figure 1.—*Rhynchoclaps warro* (De Vis). Head of type, X3.

Although *warro* and *rostralis* would appear so far to have been ignored in the literature, it is clear that they are based on two specimens of the same species. In addition, the amended descriptions of both essentially agree with the description of *Rhynchoclaps fuscicollis* Lonnberg and Andersson. De Vis' name, *Cacophis warro*, has precedence and becomes the name for the species.

The following variations occur in the series comprising the two types, a third specimen in the Queensland Museum collections, and *R. fuscicollis* as described by Lonnberg and Andersson.

EYE.—Diameter of eye from two-thirds to three-fourths its distance from the mouth.

ROSTRAL.—Portion visible from above from one-half to four-fifths its distance from the frontal.

FRONTAL.—From one and one-third to one and two-thirds as long as broad ; equal to or slightly longer than its distance from anterior of head.

CHIN SHIELDS.—May be in contact ; separated by a pair of lanceolate scales ; or separated by azygous shields.

SCALE COUNT.—Rows of scales in every case number 15 ; ventrals 141-154 ; subcaudals 15-22 pairs ; in all the anal is divided.

COLOUR.—The type of *warro* is completely bleached, but the colour pattern of the type of *rostralis* is still evident. In this specimen each dorsal scale is dark on the posterior margin, forming a reticulate pattern ; the head shields are irregularly mottled with dark brown ; there is a dark brown patch behind the head commencing on the fifth and extending to the fifteenth nuchal scale, about eleven scales wide anteriorly and contracting to one posteriorly ; the ventrals are uniformly light coloured.

The colour pattern of the third specimen in the collections is closely similar to the above, but the dark brown patch behind the head extends only from the fifth to the twelfth nuchal scale.

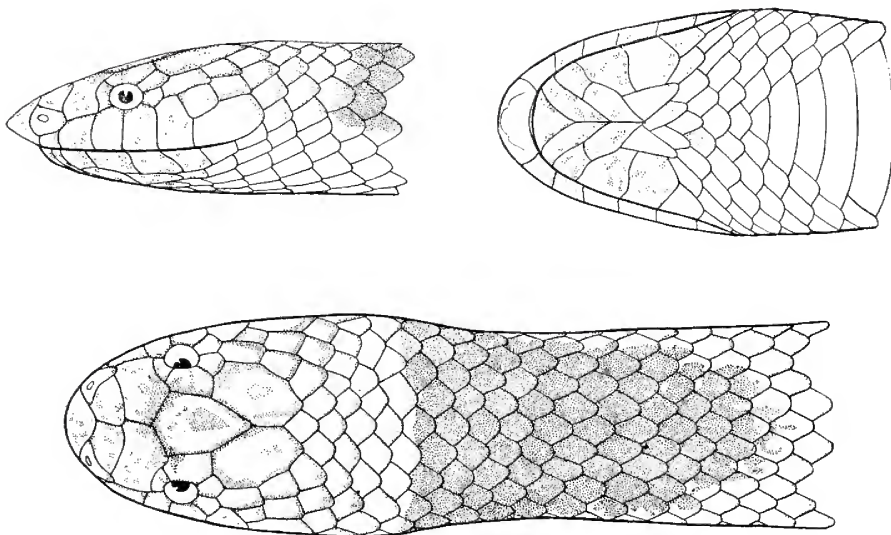


Figure 2.—*Rhynchoelaps warro* (De Vis). Type of *Denisonia rostralis* showing extent of dark brown area behind the head, X3.

From the description of *R. fuscicollis* by Lonnberg and Andersson it would appear that their single specimen also is similar, except that the dark patch behind the head is reduced. They state—"A broad blackish brown blotch occupies about six transverse rows of scales on the upper neck, beginning on the transverse row behind the parietals."

The type of *R. warro* is from Port Curtis near Rockhampton, mid-east Queensland; the type of *rostralis* and the other specimen in the collections are from the Atherton Tableland, north-east Queensland; and the type of *R. fuscicollis* was obtained at Cairns, north-east Queensland. These localities represent the known distribution of *R. warro*.

RHYNCHOELAPS LATIZONATUS De Vis = **VERMICELLA ANNULATA** (Gray).

*Calamaria annulata* Gray, Grey's Journals of Two expeditions of Discovery in North-west and Western Australia, 2, 1841, p. 443.

*Rhynchoelaps latizonatus* De Vis, Ann. Qd Mus., 6, 1905, p. 49 (Queensland).

Corrections to original description of *Rhynchoelaps latizonatus* De Vis. Type, No. J. 192 Queensland Museum.

Portion of rostral visible from above equal to half its distance from frontal (equal to distance from frontal); frontal one and a half times as long as broad (one and one-fifth times); ventrals 228 (225); subcaudals 20 pairs (19 pairs).

Longman (1916, p. 48) referred *Rhynchoelaps latizonatus* De Vis to the synonymy of *Furina annulata* (Gray). Although the type is somewhat bleached, the colour pattern characteristic of *V. annulata* is still evident.

The range of the species in Queensland, according to the material in the collections, is from the vicinity of Charters Towers in the north to the southern border, and west to Jericho.

**TROPIDECHIS DUNENSIS** De Vis.

Figure 3.

*Tropidechis dunensis* De Vis, Ann. Qd Mus., 10, 1911, p. 21 (Darro, Darling Downs, South Queensland).

Corrections to original description of *Tropidechis dunensis* De Vis. Type, No. J. 191 Queensland Museum.

Diameter of eye slightly greater than twice its distance from the mouth (twice); frontal one-third longer than broad (one-fifth), three-fourths as long as parietals (as long as parietals), and three times the width of the supraoculars (more than twice); nasal semidivided by suture on lower margin; temporals 3 and 4 (single); scales in 23 rows (21); ventrals 216; subcaudals 54 pairs (52); anal entire.

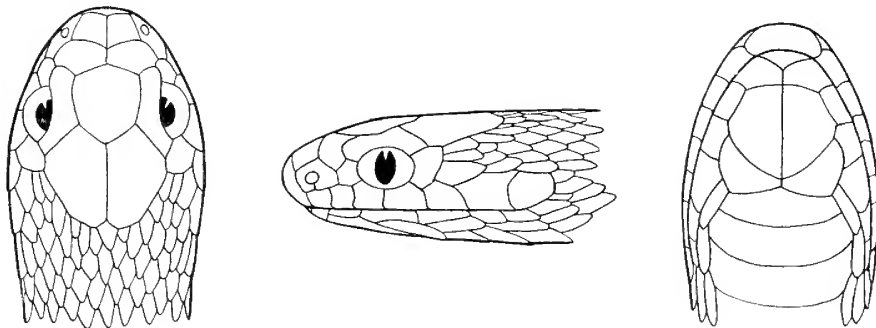


Figure 3.—*Tropidechis dunensis* De Vis. Head of type, X3.

When a species is described from a single specimen, and 40 years later the type is still the only example in the collections, there is reason to doubt its status. This is the position with regard to *Tropidechis dunensis* De Vis. The type has been examined, and it is distinct from any known Australian snake. It is nearest in some respects to the only other species of the genus *Tropidechis carinatus* Krefft.

Waite and Longman (1920, p. 179) redescribed the type, correcting errors in the original description, but they gave the frontal as one-third broader than the supraoculars, instead of three times broader, and the nasal as entire, when it is semidivided by a suture on the lower margin.

De Vis recorded Darro, Darling Downs, Queensland as the locality of his specimen, but all efforts made to trace Darro have been unsuccessful. It would appear that this name has not at any time been in use in Queensland. Warra, near Dalby, or Darrs Creek, a tributary of the Condamine River, both in the Darling Downs district have been suggested. Darra is the name of an outer suburb of Brisbane, almost 100 miles east of the Darling Downs.

The receipt of only one specimen from such a well-known area, and the doubt about the locality as given by De Vis, suggests the possibility that the type of *Tropidechis dunensis* De Vis might not be an Australian collected specimen. This possibility has yet to be investigated.

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## SOME LAUXANIIDÆ (DIPTERA) IN QUEENSLAND COLLECTIONS.

HARRY F. LOWER.

Waite Agricultural Research Institute, University of Adelaide.

Through the courtesy of Mr. George Mack, Director of the Queensland Museum, and Dr. W. A. McDougall, Senior Entomologist, Department of Agriculture and Stock, I have had the opportunity of examining the lauxaniid material in the collections of the Museum and the Department. As a result, some species are recorded for the first time from Queensland, and one is represented by the only specimen known in Australia. Three new species are described, and one known species is redescribed.

It is doubtful if even one-tenth of the lauxaniid fauna of Queensland is known, a fact probably due to the smallness of the insects and to their having little or no direct economic importance. As both morphologically and biologically this family is of considerable interest, it is to be hoped that this position will soon be rectified, at least in part, since collecting merely involves the sweeping of grasses and low-growing herbaceous vegetation, especially near water.

The following genera are represented in the collections.

Genus **STEGANOPSIS** de Meijere.

*Steganopsis melanogaster* Thomson was described from New South Wales. This is the first record from Queensland where apparently it is common as indicated by the large number of specimens from wide-spread localities.

Genus **POECILOHETAERUS** Hendel.

*Pocilohetaerus schineri* Hendel appears to be an ubiquitous lauxaniid. It was described from New South Wales, but it is common in Queensland. Professor O. W. Tiegs informs me that it is a common insect in Victoria, while in South Australia it is present wherever grass grows.

Genus **MELANINA** Malloch.

A single specimen of *M. aenescens* Malloch is in the collection of the Department of Agriculture and Stock, Brisbane. The type is not in Australia, although it and six paratypes were collected by H. Petersen at Cronulla, New South Wales, in December, 1925. The present specimen therefore, which was taken at Harlin, Queensland, would appear to be unique in Australia until more material is obtained.

Genus **SAPROMYZA** Fallen.

This genus is represented in the material by nine species. *S. brevicornis* Malloch, *S. maculithorax* Malloch, *S. nigricornis* Macquart, *S. sciomyzina* Schiner, and *S. tenuicornis* Malloch, are recorded from Queensland for the first time. Several

specimens of *S. pictigera* Malloch (Figure 1) which was originally described from Queensland, are present. This is a striking species, the unusual colouration of the wing is unlike that of any other known *Sapromyza*. The species would appear to be restricted to Queensland.

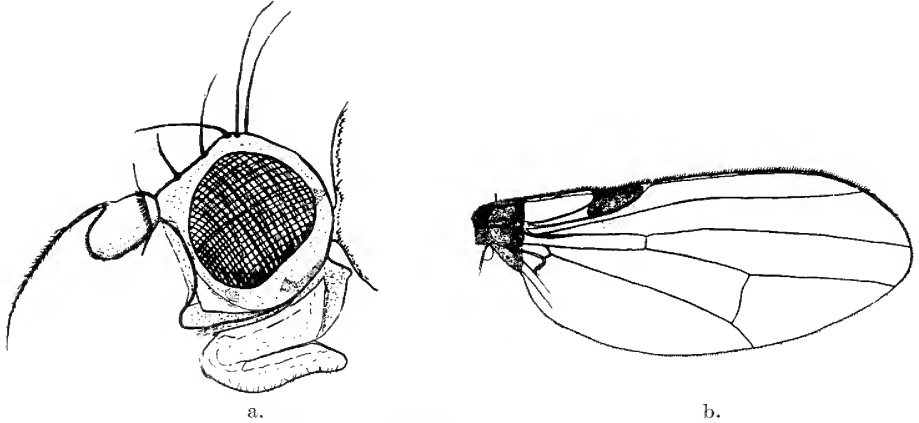


Figure 1.—*Sapromyza pictigera* Malloch. a. Head. b. Wing.

*S. tenuicornis* (Figure 2) is an aberrant member of the genus, and its exact status remains to be determined. It differs from other species of the genus in the shape of the head and the very long antennae (Figure 3). Mr. D. J. Lee kindly checked the type in the collection of the School of Public Health and Tropical Medicine, Sydney, and he has informed me that the “abdomen of the type is orange-brown, with the apices of the tergites infuscated.” This exactly agrees with the seven specimens in the Queensland Museum collection, and differs markedly from the description by Malloch (1927):—“Abdomen glossy black, yellowish on disc basally, where it is slightly grey-dusted”.

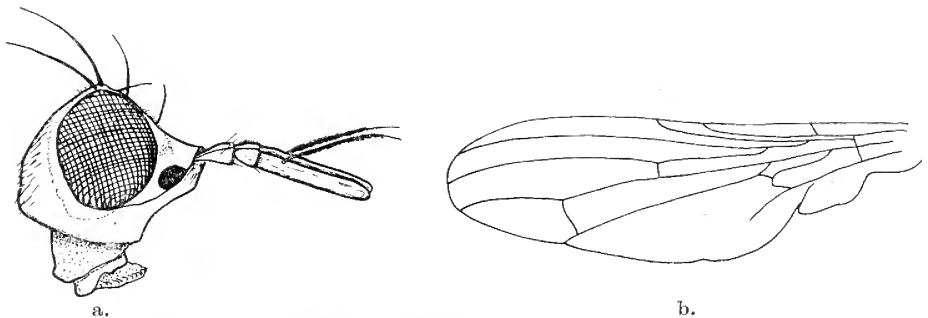


Figure 2.—*Sapromyza tenuicornis* Malloch. a. Head. b. Wing.

Following are descriptions of two new species of *Sapromyza* from the collections of the Queensland Museum.

The venational notation used was described by me in a recent paper (Lower, 1951).

**SAPROMYZA HARDII** sp. nov.

Figure 3.

LENGTH. 6 mm. COLOUR. Brownish, translucent, and polished.

HEAD. Rounded, brownish in colour. (Figure 3a).

FRONS. Sub-quadrate, slightly wider than long, brown, semi-polished; ocellar triangle fuscous, ocellar bristles short. Two pairs of fronto-orbital bristles, both long, strong, and reclinate. Posterior pair one-third of the distance between the anterior ocellus and the anterior margin of the frons. Anterior pair midway between posterior pair and anterior margin of frons.

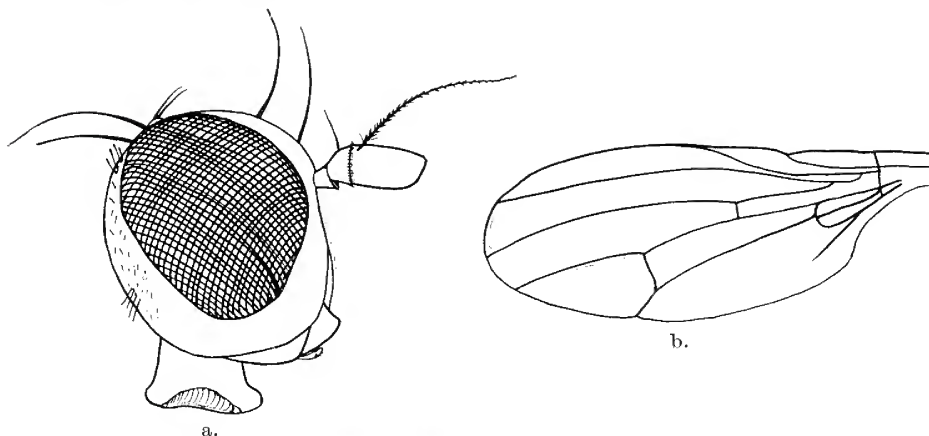


Figure 3.—*Sapromyza hardii* sp. nov. a. head. b. Wing.

FACE. Slightly convex, almost flat, brownish-yellow. Mouth normal, palpi yellowish.

EYE. Higher than long, posterior margin straight.

ANTENNAE. Short and stout. Third segment sub-oval  $\frac{l}{w} = 2$ , brownish. Arista more than twice as long as three antennal segments together, dark brown and haired, longest hairs less than half the width of third antennal segment.

THORAX. Oval, orange-brown, translucent, without markings. Three pairs of strong, post-sutural, dorso-central bristles, anterior pair immediately behind the suture. One pair of long, strong, acrostichal bristles. A well developed bristle slightly mesad of the supra-alar on thoracic dorsum.

SCUTELLUM. Concolorous with thorax, convex, white pollinose.

WINGS. Brownish-yellow (Figure 3b),  $r_4$  —m a little basad of junction of  $R_1 + 2$  with C, and a little less than half way along cell  $M_2 + M_3$ .  $r_{4+5}$  is almost straight, and terminates in  $M_4$  at less than its own length from wing margin.

LEGS. Brownish-yellow with infuscated band at distal ends of tibiae. Fore femur without antero-ventral comb. One strong, curved, black bristle in infuscated area. Distal ends of hind femora infuscated.

HALTERES. Dark brown.

ABDOMEN. Typical in shape, brownish-yellow, a very dark brown incised dorsal band along posterior margin of each tergite.

GENITALIA. The type is carded and little can be seen, but parts visible are typical of the genus.

TYPE LOCALITY. Blackheath, New South Wales. 13th November, 1919 (G. H. Hardy).

TYPE. Female, and four paratypes (all females) mounted on card, in collection Queensland Museum.

I have named this species in honour of Mr. G. H. Hardy to whom Australian dipterists will always be greatly indebted.

The species has its closest affinities with the *aberrans* group, the members of which have a well defined bristle on the thoracic dorsum mesad of the supra-alar bristle. In Malloch's key (Malloch 1928), it will trace down to section 35 which contains *S. aberrans* and *S. maculithorax*. The unmarked thorax at once differentiates it from the other two which have the thorax markedly patterned.

**SAPROMYZA VENUSTA** sp. nov.

Figure 4.

LENGTH. Female, 6 mm. GENERAL COLOUR. Brownish.

HEAD. (Figure 4.)

FRONS. Produced in front of eyes, flat,  $\frac{l}{w} = \frac{3}{2}$ , bright orange-yellow with satiny sheen, finely pollinose. Fronto-orbital strips slightly darker and densely covered with microscopic hairs. A few scattered black setulae near anterior margin.

Two pairs of fronto-orbital bristles strong, of equal length, reclinate, and shorter than the inner verticals. Ocellar triangle fuscous; ocellar bristles very small, indistinguishable from other hairs in this area.

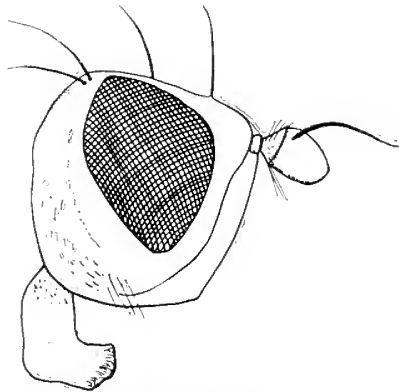


Figure 4.—*Sapromyza venusta* sp. nov. Head.

**FACE.** Very slightly convex, strongly carinate, antennal foveae well marked, golden-yellow, polished. Parafacials golden-yellow, densely white pollinose. Mouth normal, palpi blackish-brown and very strongly haired.

**EYES.** Quadrilateral in outline,  $\frac{\text{vertical diameter}}{\text{horizontal diameter}} = \frac{3}{2}$ .

**ANTENNAE.** Short, total length slightly more than length from anterior fronto-orbital bristles to anterior margin of frons; dark brown. Third segment oval,  $\frac{l}{w} = \frac{3}{2}$ . Arista twice length of whole antenna; dark brown, finely and densely pubescent.

**THORAX.** Normal, yellowish-brown, white pollinose. Three pairs of dorso-central bristles, anterior pair weaker than posterior and well behind suture. One pair of acrostichals, much finer than dorso-central bristles. All other dorsal bristles long and strong. Six to seven series of black, intra-dorso-central setulae.

**SCUTELLUM.** Convex, obtuse, yellowish; one pair of sub-lateral and one pair of apical scutellar bristles.

**PLEURAL AREAS.** Tawny. Two meso-pleural bristles, upper about twice the length of lower; two strong sterno-pleurals, anterior weaker than posterior.

**WINGS.** Yellowish-brown hyaline.  $Cu_1 + 1A$  can be traced to very near the wing margin, and  $2A$  is almost as long.  $r_4 - m$  at same distance from wing base as junction of  $R_1 + 2$  with  $C$ , and near middle of cell  $M_2 + M_3$ .  $se$  is straight.

**HALTERES.** Tawny.

**LEGS.** Honey-yellow with brown markings on fore tarsi, distal ends of fore tibiae, and terminal segments of mid and hind tarsi. Fore femur with many strong bristles, but no antero-ventral comb. Mid tibia with two strong and one weaker apical, and two strong pre-apical bristles.

**ABDOMEN.** Normal in shape, dark orange-brown, highly polished, a broad black band covering the anterior half of the tergite of the first abdominal segment.

**GENITALIA.** Typical of genus.

**TYPE LOCALITY.** Brisbane, Queensland. 10th August, 1915 (H. Hacker).

**TYPE.** Female, in collection Queensland Museum.

In Malloch's key (1928), this species will trace out to section 28, which contains *atrimana* and *nigricornis*. From both of these, *S. venusta* can be easily distinguished by the almost entirely yellow legs, and the brilliant colouring of the frons.

Genus **HOMONEURA** van der Wulp.

Five species of this genus are represented. *H. illingworthi* Malloch and *H. proximella* Malloch, which were described from Queensland, are apparently common. *H. preapicalis* Malloch and *H. fumifrons* Malloch were described from New South Wales and this is the first record of their occurrence in Queensland. One new species is present.

#### **HOMONEURA NUBILA** sp. nov.

Figure 5.

**LENGTH.** Male, 3.0—3.5 mm.; female, 5 mm. **GENERAL COLOUR.** Brownish-yellow.

**HEAD.** Round, tawny-yellow (Figure 5a).

**FRONS.** Slightly wider than long, yellowish with two brown vittae which converge towards the anterior. Fronto-orbital strips raised, white pollinose. Two pairs of fronto-orbital bristles; posterior pair long, strong, and a little anterior to the anterior ocellus; anterior pair not so strong, midway between anterior margin of frons and posterior pair. Both pairs reclinate.

**FACE.** Almost equilateral-triangular in outline, whitish to yellowish, pollinose, almost flat, not carinate. Mouth normal, palpi yellowish.

**EYE.** Higher than long.

**ANTENNAE.** Short, brownish-yellow. Third segment oval,  $\frac{l}{w} = 2$ . Arista dark brown and plumose, longest hairs longer than width of third antennal segment. Ocellar triangle fuscous; ocellar bristles about same length as inner verticals.

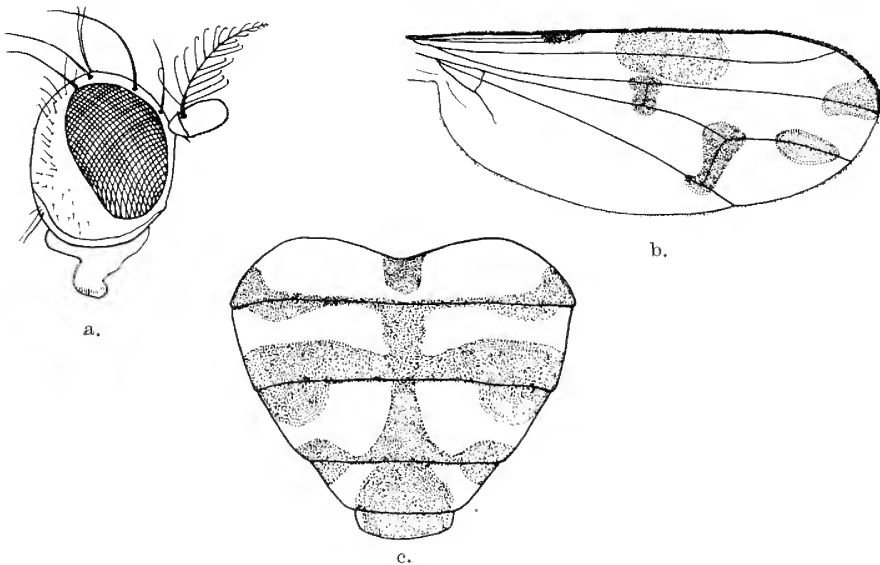


Figure 5.—*Homoneura nubila* sp. nov.

a. Head.      b. Wing.      c. Abdomen.

**THORAX.** Normal in shape, greyish pollinose with four well-marked, brownish vittae. The central pair are united at the anterior of the dorsum, and each curves outwards near middle pair of dorso-central bristles to join outer pair of vittae, each of which is interrupted at the suture. External to these, and not so evident, is a third pair of posterolateral vittae extending along outer margin of the dorso-central bristles.

The pleural areas are yellowish-brown with a darker brown mark just below each post-humeral bristle.

Three pairs of dorso-central bristles behind suture, anterior pair close to suture and somewhat weaker than the two posterior pairs. Five to seven series of black setulae between the dorso-central bristles. One pair of aerostichal bristles.



**SCUTELLUM.** Flat, yellowish, brown on disc, white pollinose. One pair of sub-lateral and one pair of apical scutellar bristles. One strong meso-pleural, two strong sterno-pleural bristles, anterior weaker than posterior.

**WINGS.** (Figure 5b.) The pattern is characteristic. Six well-defined dark brown areas are present: on apical part of cell Sc and encroaching on cell R; an oval patch touching the Costa and extending posteriorly almost to  $R_4$  (in the female, this area is at least twice the size of the corresponding area in the wing of the male); a dumb-bell-shaped area over  $r_4-m$ ; a larger, more irregular patch over  $se$ ; an area touching the costal margin and covering the termination of  $R_4$ ; and an oval area, not touching the wing margin near the termination of  $R_5+M_1$ .

**HALTERES.** Brownish-yellow.

**LEGS.** Yellowish. Hind tibia with one strong apical and two strong sub-apical spurs. Fore femur without an antero-ventral pre-apical comb.

**ABDOMEN.** Yellowish with prominent dark brown markings. Somewhat broader than normal.

**GENITALIA.** The type is carded but it can be said that the genitalia are as in *Homoneura*.

**TYPE LOCALITY.** Tooloom, New South Wales. January, 1926 (H. Hacker).

**TYPE.** Male, and two paratypes (one male and one female) in collection Queensland Museum.

In Malloch's key (Malloch 1927), this species will trace down to section 6 containing *Homoneura preapicalis* Malloch from which it may be distinguished by the absence of an antero-ventral comb on the fore-femur, the vittate thorax, and the characteristically marked dorsal surface of the abdomen.

Genus **CEPHALOCONUS** Walker.

**CEPHALOCONUS TENEBROSUS** Walker.

Figure 6.

*Cephaloconus tenebrosus* Walker, J. Linn. Soc. Lond., Zool., 5. 1861, p. 300.

I consider it desirable to provide the following description of *Cephaloconus tenebrosus* Walker three specimens of which are present in the collection of the Department of Agriculture and Stock, Brisbane.

**LENGTH.** Male, 5 mm.; female, 6 mm. **GENERAL COLOUR.** Brownish.

**HEAD.** Brownish (Figure 6a, b).

**FRONS.** Sub-rectangular and flat,  $\frac{l}{w} = 2$ , maximum width attained at level of anterior fronto-orbital bristles. Tawny in male, with two well marked brown vittae; brownish in the female, and dusted all over, the dusting palest along the fronto-orbital strips. A rectangular, black, satiny mark between each eye and antennal base. In both sexes, the frons bears irregularly scattered black setulae.

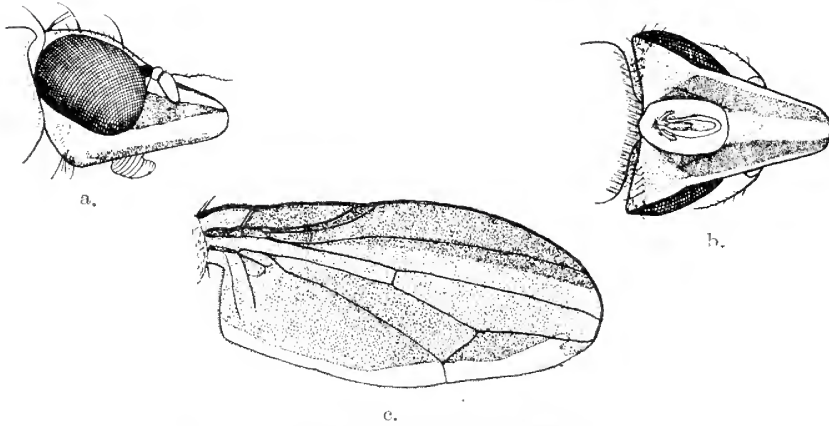


Figure 6.—*Cephaloconus tenebrosus* Walker.  
Head., a. lateral., b. ventral. c. Wing.

Two pairs of fronto-orbital bristles are present, very close to the eyes. The anterior pair is about two-thirds, the posterior pair, one-third along the frons. Both pairs are strong, recurved, and behind each posterior bristle is a rather strong hair. The ocellar triangle is fuscous; ocellar bristles short, only reaching the bases of posterior fronto-orbital bristles.

**FACE.** Remarkably produced in the form of a cone, prolongation somewhat longer than greater diameter of the eye which is higher than long. Orange-yellow in colour with five brown vittae, all widest at base next the eye, and tapering to a point at tip of facial cone. One vitta on each side of the face, one dorsal, and one at each ventral angle of the cone along sides of the mouth which is situated towards the base of a triangular area on ventral surface. At the tip of facial cone, the end of dorsal vitta is connected with the ends of two lateral vittae. Palpi, orange-brown.

**ANTENNAE.** Orange in colour, short, the third segment oval,  $\frac{l}{w} = 2$ . Arista brownish-black, lightly haired, longest hairs a little longer than width of the arista at base.

**THORAX.** Parallel sided, not as wide as head, dark brown with two, wide, sub-medium, grey-dusted vittae, and two very thin lateral vittae, yellowish-white in colour.

Three pairs of long, strong, post-sutural, dorso-central bristles, one pair of long, thin, pre-scutellar acrostichal bristles; seven to eight series of black intra-dorso-central setulae; humeral and post-humeral bristles long and strong; meso-pleura haired with one, strong, posterior meso-pleural bristle; two sterno-pleural bristles, posterior a little more robust than anterior.

**SCUTELLUM.** Acute and convex, brownish, white pollinose. One pair of apical cruciate scutellars and one pair of marginal scutellars.

**WINGS.** Longer than the body, dark brown, except for a colourless band along anal margin (Figure 6c); brown colour deepest on costal margin, especially along veins, and tending to lighten towards anal margin. Stout costal spines pass along the wing margin until they reach  $R_4$  where they are discontinued as in *Homoneura*.

**HALTERES.** Yellowish.

**LEGS.** All femora brown, tibiae and tarsi yellowish, fore-femur with an antero-ventral comb.

**ABDOMEN.** Oval, polished, yellowish-brown in colour, with scattered strong black hairs, four sub-median along posterior margin of each tergite strongest.

**GENITALIA.** The genitalia were not dissected out, but in one female, they appear to have much in common with those of *Sapromyza*.

The species was described from New Guinea by Walker, and this extended description is provided because of its general interest.

There are two specimens, collected by J. L. Froggatt at Byfield, Queensland, in the British Museum. Of three examples in the collection of the Department of Agriculture and Stock, Brisbane, one is from Byfield, collected by Froggatt at the same time as the British Museum material ; it was taken on the leaf of a banana plant. A second, also collected by Froggatt at Berner Creek, near South Johnstone, Queensland, has a note to the effect that it was taken on a banana plant and that the pupa was under the leaf. There is no information with the third specimen ; the initials " F.B." are on the label.

#### ACKNOWLEDGMENTS.

I wish to thank Messrs. D. J. Lee of the School of Public Health and Tropical Medicine, Sydney, and T. G. Campbell of the C.S.I.R.O., Canberra, for supplying me with lists of types and determined specimens in their respective collections.

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## NEW SCOLYTOIDEA.

KARL E. SCHEDL.

Lienz, Austria.

In a small consignment of Scolytoidea forwarded for determination by the Commonwealth Institute of Entomology, London, two new species are present. A third is added from another collection, and three new records are noted.

**PHLOEOTRIBUS AUSTRALIS** sp. nov.

Figure 1.

Piceous, rather dull; 2.9 mm. long, 1.5 times as long as wide.

Front with two slight traverse depressions, one just above the insertion of the antennae, the other shallower and just above the epistomal margin; the sides elevated and carinated between these two subimpressed areas; surface rather dull, densely punctulate; pubescence inconspicuous, sparse and very short.

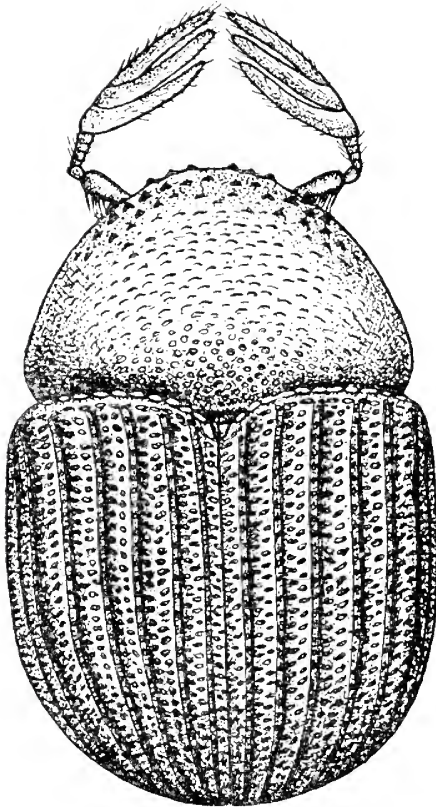


FIGURE 1.—*Phloeotribus australis* sp. nov.  
Dorsal view.

Pronotum much wider than long (50:31), widest at the medianly angulated base; sides strongly curved and narrowed from the base to the rather narrowly rounded apex, without any distinct subapical constriction; apical margin armed with recurved asperities, those at the supposed antero-lateral angles coarser than those at the extreme apex; surface ascending from apex to the base, very densely and rather finely punctured all over on a minutely punctulate ground sculpture, with inconspicuous short pubescence. Scutellum knob-like, dull.

Elytra distinctly wider than the pronotum (56:50) but very little longer than wide when viewed from above; basal third of sides subparallel, thence incurved to the very broadly rounded apex; declivity commencing after the basal third, very strongly convex; striae-punctate, punctures rather small and indistinct in some parts; interstices much wider than the narrow striae, dull, uniseriately and rather finely granulate-tuberculate, becoming somewhat transversely wrinkled near the base; first three interstices extending to the apical margin, four and eight and five and seven joining apically, six ceasing in the angles of five and seven, forming a slightly elevated area, visible from above; interstices distinctly lower on the declivity, pubescence inconspicuous (probably partly abraded).

TYPE in collection Schedl.

LOCALITY.—Queensland, Australia.

This is the first species of the genus recorded from the Australian region. It is easily recognized by its shape and sculpture.

**XYLEBORUS CILIATIFORMIS** sp. nov.

Figure 2.

FEMALE.—Yellowish-brown, elytra decidedly darker; 1.6 mm. long, nearly 2.4 times as long as wide.

Front very shining, plano-convex, irregularly punctured and sparsely pubescent below.

Pronotum nearly as wide as long; postero-lateral angles obtusely rounded; basal half of sides subparallel, thence gradually rounded towards the apex; the latter broadly arcuate and medially armed with very low and partly indistinct dentations; summit in the middle, moderately high; anteriorly densely and rather finely asperate; posteriorly brightly shining and very finely punctured; pubescence inconspicuous. Scutellum moderate in size, shining.

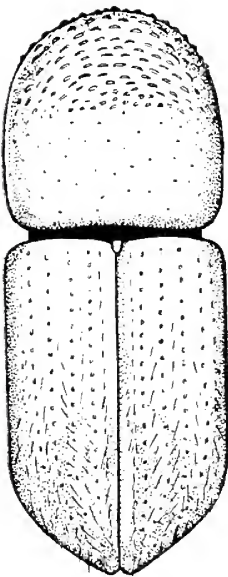


FIGURE 2.—*Xyleborus ciliatiformis* sp. nov.  
Dorsal view.

Elytra as wide and 1.5 times as long as the pronotum; sides subparallel, then slightly and later more abruptly incurved to the rounded triangular apex; apical margin acute as in allied species; cylindrical in basal half, very obliquely convex behind; with a shallow longitudinal depression along the suture on the upper half of the declivity; roof-shaped towards the suture, elevated below; disc brightly shining, with fairly regular rows of very fine punctures, the interstices wide, with a few visible scattered punctures; declivity without any distinct punctuation but minutely punctulate and therefore less shining; pubescence on the disc of closely spaced rows of very short inclined yellowish hairs, some rows apparently arising from the striae punctures, others from punctures of the interstices; the hairs becoming longer and distinctly directed towards the suture on the lateral convexities of the declivity, without any remarkable pubescence below.

TYPES in collection British Museum of Natural History (two specimens) and in collection Schedl (one specimen).

LOCALITY.—Brisbane, Australia, in imported logs of Borneo Cedar, August 1947, A. R. Brimblecombe.

This species is rather closely allied to *Xyleborus ciliatus* Egg. and *X. justus* Schedl, but is remarkable for the shape of the pronotum and the rather long and cylindrical elytra.

**XYLEBORUS ABRUPTULUS** sp. nov.

Figure 3.

FEMALE.—Reddish-brown, subshining; 1.9 mm. long, 2.2 times as long as wide.

Front plano-convex, silky shining, minutely punctulate, very shallowly and rather indistinctly punctured, with sparse inconspicuous pubescence.

Pronotum wider than long (26.0 : 19.5), postero-lateral angles little more than right angles; sides subparallel, feebly arcuate in basal half; apex broadly rounded in dorsal view, with several small asperities in the centre, thus appearing feebly extended; summit well behind the middle; anterior part steeply convex, rather finely and densely asperate; posterior part subopaque, minutely punctulate, very shallowly and indistinctly punctured; pubescence short and sparse. Scutellum triangular, shining.

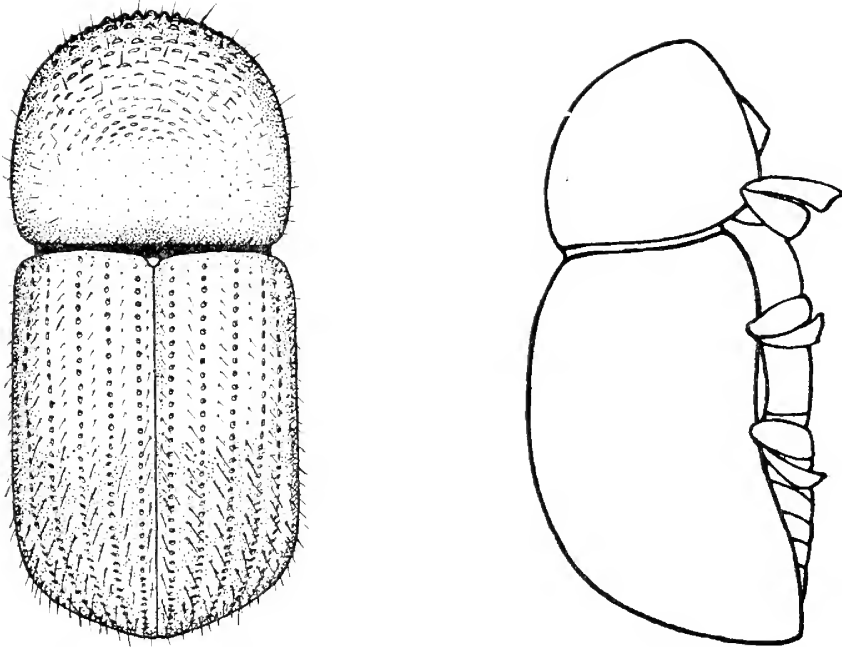


FIGURE 3.—*Xyleborus abruptulus* sp. nov. Left, dorsal view; right, lateral view.

Elytra as wide and 1.8 times as long as the pronotum; sides parallel to well beyond the middle; apex broadly and somewhat angulately rounded; declivity commencing about the middle steeply convex; disc with regular rows of rather fine punctures becoming more closely placed and more distinct in declivity; interstices wide, each with a row of more remotely placed punctures of equal size which change into granules towards the declivity, where they are better developed; pubescence arising from interstitial punctures and granules, rather dense on the declivity.

TYPES in collection British Museum of Natural History and in collection Schedl.

LOCALITY.—Wongabel, Australia, 2nd May, 1941, A. R. Brimblecombe, from *Loranthus* sp.

Allied to *Xyleborus deruptulus* but somewhat more slender, less shining, and more roughly sculptured.



## NEW RECORDS.

*Cryphalus capucinomorphus* Schedl. Santo, New Hebrides, August-September, 1930, L. E. Cheesman; Malekula, New Hebrides, September, 1930, L. E. Cheesman.

*Xyleborus semigranosus* Blandf. Nelson, New Zealand, 1932, A. F. Clark, in hardwood crate from Samoa.

*Platypus curtus* Chap. Brisbane, Australia, August, 1947, A. R. Brimblecombe, in imported logs from Borneo.

## A REVISION OF THE DACETINE ANT GENUS ORECTOGNATHUS.

WILLIAM L. BROWN, JR.

Harvard University.

Two closely related genera, *Orectognathus* Fred. Smith and *Arnoldidris* Brown, make up the subtribe Orectognathiti of the tribe Dacetini, subfamily Myrmicinae of the Formicidae.

In the revisionary matter which follows deposition of specimens is indicated by the following abbreviations: Australian Museum, Sydney [AM]; British Museum (Natural History), London [BMNH]; collection of John Clark, Melbourne [Coll. Clark]; collection of Carlo Emery, Museo Civico di Storia Naturale, Genoa [Coll. Emery]; collection of Auguste Forel, Museum d'Histoire Naturelle, Geneva [Coll. Forel]; Hungarian National Museum, Budapest [HNM]; collection of J. J. McAreavey, Melbourne [Coll. McAreavey]; collection of E. Mjöberg, Stockholm Museum [Coll. Mjöberg]; Museum of Comparative Zoology, Harvard University [MCZ]; Queensland Museum, Brisbane [QM]; South Australian Museum, Adelaide [SAM]; United States National Museum, Washington [USNM]; Western Australian Museum, Perth [WAM].

Mr. John Clark furnished much of the undetermined material on which this study is based, and aided with much valuable historical information and advice. He also allowed me access to some of Forel's type material in his possession. The specimens are indicated by asterisks. Forel retained some of the specimens he described from Mjöberg's and other collections, and sent some of the types to Prof. Sjöstedt, who in turn sent some to Mr. Clark. Material was also furnished by Mr. H. Womersley [SAM], Mr. K. McKeown [AM], Mr. R. B. Benson [BMNH], Mr. G. Mack [QM], and Dr. J. C. Bequaert [MCZ], and Father J. J. McAreavey. Mr. Tom Greaves of the Division of Entomology, C.S.I.R.O., supplied information on the type localities for *Orectognathus mjobergi* and *O. sexspinosus*.

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With the descriptions are included certain measurements and proportions which I consider necessary standards in the proper characterization of dacetine ants. The symbols and their meanings, stated below in abbreviated form, are explained in Brown (1949), and more fully in my study of *Smithistruma* and related genera (in press):—

- HL. Length of head, dorsal view, maximum observable distance between a line connecting the posterior extremities of the occipital lobes (including teeth if present) and the parallel connecting the anterior extremities of the clypeal border.
- ML. Exposed length of closed mandibles, measured from the apical point to the line connecting the anterior extremities of the clypeal border. The viewing plane must not be altered from that in which HL is observed.
- WL. Weber's diagonal length of alitrunk, measured in lateral view along a line connecting the antero-dorsal pronotal margin (or place where pronotum joins cervix) and the apices of the inferior lobes or flanges of the sides of the propodeal declivity.
- TL. Total length, HL + ML + WL + visible (lateral view) axial lengths of petiole, postpetiole and gaster, excluding sting, each rigid unit measured separately. If the occipital lobes surpass the pronotal margin, the amount of overlap is deducted. This length is the only one that can be used as a standard. Measurements of previous authors are neither comparable with TL nor among themselves.
- CI. Cephalic index, or maximum measurable width of head (excluding occipital teeth if present) expressed as a percentage of HL.
- MI. Mandibulo-cephalic index, ML expressed as a percentage of HL.

Measurements of scape length and petiole length are the observed maxima. All measurements are stated in millimetres. Repeated checks on specimens belonging to this subtribe have shown that error of measurement normally does not exceed the following limits: HL and ML,  $\pm .01$ ; WL,  $\pm .02$ ; TL,  $\pm .05$ . Errors in the indices usually are about  $\pm 1$ .

#### Subtribe **ORECTOGNATHITI**.

WORKER.—Size medium, length between 4 and 8 mm. Monomorphic or polymorphic. Head of the primitive "strumigeniform" tribal shape, with well developed occipital lobes and strongly narrowed anterior portion, the whole more or less depressed. Vertex raised, medially sulcate; occipital lobes depressed or concave; clypeus medially concave. Frontal carinae produced backwards as distinct, though posteriorly weak ridges bordering the shallow, poorly defined antennal scrobes dorso-medially. Eyes large, placed laterally in the scrobal region near or before mid-length of the head, fully exposed to dorsal view. Mandibles elongate, linear, somewhat depressed, approximately parallel at full closure; inner borders each with strong acute basal tooth or spine, directed obliquely mesad and posteriorly, largely concealed beneath the clypeus.

at full closure; apical armature consisting of three strong, incurved, more or less spiniform teeth of which the ventral pair are conjoined to form a short fork; dorsal-most tooth longer. Antennae distinctive, long and slender, with scape usually gently incrassate in apical half; funiculus with four segments, all longer than broad, second longest, apical segment incrassate.

Under-mouthparts (not investigated in *Arnoldidris*) closely retractile into mouth cavity; palpi slender, maxillary with five and labial with three segments. Labrum a short, broadly transverse plate with deep median cavity to receive basal mandibular teeth; laterally with a narrow, carinate lobe fitting into the ventral cavity of the closed mandible between basal tooth and condyle and bearing an attenuated, anteriorly directed trigger hair. Labrum covering less than half of mouth cavity when closed down, apex broadly excised or emarginate.

Alitrunk variable, but with long, acute, divergent propodeal spines, not subtended by infradental lamellae. Petiole very elongate, slender, with a gradually tapering peduncle, with or without a distinct node. Postpetiole simple, convex above, constricted off rather strongly from adjacent segments. Gaster short, broadly oval, the first (basal) segment making up the great part of its bulk; apical segments crowded, somewhat ventrally directed. Sting well-developed. Legs long and slender, but with more or less incrassate femora and tibiae.

Primitive sculpture when developed, consisting of dense, coarse umbilicate-foveolation of head, alitrunk and nodes; gaster usually smooth, shining, rarely very finely and superficially sculptured. In *Arnoldidris* and one species of *Orectognathus*, the foveolation gives way dorsally to a surface largely smooth and shining. Pilosity usually almost obsolete, especially on dorsal surfaces of head and alitrunk; rarely with fairly abundant short, fine, erect hairs. Most species with a few, long, erect hairs along the inner mandibular borders and near the gastric apex, with sparsely distributed adpressed microscopic pubescence on the appendages, ventral surface of head, and to a lesser extent on the gastric dorsum. Colour ferruginous in varying degree, often with a broad pattern of deep infuscation.

Female and male known only for *Orectognathus*.

DISTRIBUTION.—The subtribe is restricted to Eastern Australia, Tasmania, New Guinea, New Caledonia, New Zealand and islands adjacent to these areas. Thirteen species are recognised and these are divided into two genera of which one, *Arnoldidris*, is known only from New Guinea and its coastal islands. It is possible that additional species will be collected in Queensland, New Guinea and the Solomon Islands.

Knowledge of the biology of the subtribe is limited, but one species is known to be a collembolan-feeder. This habit is widespread among the genera of the related subtribes Strumigeniti and Epopostrumiti, so it would not be surprising if it were basic to the ethology of the Orectognathiti. The orectognathite species apparently form very small colonies and inhabit rotten wood and the soil under stones.

The Orectognathiti are related to the primitive dacetine genera *Daceton* Perty and *Acanthognathus* Mayr. Santschi (see Smith, 1944) remarked on this, and compared and figured the antennae of *Acanthognathus* and *Orectognathus*. The polymorphism, shown by *Orectognathus versicolor* and *O. clarki*, is similar in many respects to that of *Daceton*. It also appears in some primitive members of the other two subtribes, and must represent a very ancient condition. In most dacetine species, a very narrow monomorphism exists, with the worker and female castes differing but little in size and proportions. Apparently this monomorphism has been attained independently in each of the four subtribes in conjunction with increasing specialization for a cryptobiotic existence.

## KEY TO THE GENERA OF THE ORECTOGNATHITI, BASED ON THE WORKERS.

Promesonotum continuously convex, completely unarmed, the humeri gently rounded; petiole extremely long, the node not discernible in lateral view. . . . . *Arnoldidris* Brown.

Pronotum depressed and horizontal, with distinctly dentiform or spinose humeri; mesonotum suddenly raised and armed with one or two pairs of tubercles, welts or small teeth; petiole usually shorter, with a distinct node discernible in lateral view. . . . *Orectognathus* Fred. Smith.

**ARNOLDIDRIS** Brown.

*Arnoldidris* Brown, 1950, Trans. Amer. Ento. Soc., 76, pp. 143-5.

GENOTYPE.—*Orectognathus chyzerei* Emery.

The original diagnosis is accompanied by a key and synonymic references to the four species; *A. biroi* (Szabó), *A. chyzerei* (Emery), *A. horvathi* (Szabó), and *A. longispinosus* (Donisthorpe). The diagnosis must now be narrowed, due to the discovery of *Orectognathus satan* sp. nov. which has occipital teeth and extremely elongate propodeal spines. The structural differences in the pronotum, mesonotum and petiole, listed as characters (1) and (2) in the original paper, are the outstanding features of the genus and are quite satisfactory for the purpose of separating it from *Orectognathus*.

A brief examination of the holotype of *A. longispinosus* in the British Museum showed it was originally incorrectly described by Donisthorpe. Instead of the sharp teeth which Donisthorpe described as present on the occipital extremities, I found I found only bluntly angulate occipital corners similar to those described and figured by Emery for *A. chyzerei* and by Szabó for *A. biroi*.

*A. longispinosus* possibly may be synonymous with one of these species. The type needs thorough study before a decision is made. My key should be modified by shifting *A. longispinosus* from couplet 2 to couplet 3. Colour may be used as a further separatory character until a proper study can be made of the species in couplet 3.

**ORECTOGNATHUS** Fred. Smith.

*Orectognathus* Fred. Smith, 1853, Trans. Ento. Soc. Lond. (Ser. 2). 2. p. 227.

*Orectognathus* Emery, 1922, Genera Insectorum, Fasc. 174, p. 318, partim.

GENOTYPE.—*Orectognathus antennatus* Fred. Smith, monobasic.

WORKER.—Monomorphic or polymorphic, with characters of the subtribe plus those given in the key. Additional characters which may have one or more exceptions among the species: Frontal carinae each with a short, flat anteocular tooth. Mandibles often with the inner margins each produced as a narrow, translucent cultrate lamella, usually more or less expanded to form a low subapical flange or low tooth; beyond this, the inner border falls away rapidly, forming a preapical concavity. Petiolar node mostly with a pair of short conical teeth placed bilaterally

at the summit; the teeth variable in development, even within single nest series. Head, alitrunk and nodes densely covered with distinct, circular umbilicate foveolae; gaster largely or entirely smooth, shining. Pilosity as for subtribe.

Pupae of worker (and female) with mandibles widely open and a pair of large, elongate sac-like lobes extending forward between them.

FEMALE.—Similar in size to the largest workers, to which caste it is sometimes connected by a series of intermediate forms, including wingless ergatoids. Mandibles usually slightly shorter and head very slightly broader than in workers of the same head length. The female characters are those common to most dacetines, very large compound eyes, small ocelli, thoracic sclerites developed, petiole, postpetiole and gaster relatively broader and more bulky than in the worker. The spines and teeth on head and alitrunk less well developed than in the worker, but sometimes the reverse is true of the petiolar teeth. A study of the ergatoid forms shows that the narrowly rounded and laterally projecting prescutellar lobes of the female are homologues of the posterior pair of mesonotal teeth or tubercles of the worker. Wings (known only for *O. versicolor*) clear, venation as in the males; posterior wings with six subapical hamuli. Prescutum with a distinct median carinula.

MALE.—(Known for *O. antennatus*, *O. clarki*, *O. sarasini*, and *O. sexspinosus*). Body slender; size, except for very small head and mandibles, much as in worker and female. Head rounded above, narrow behind; with cervical border and eyes, as broad as than long or broader. Clypeus produced as a short, transverse apron, with subangulate anterolateral corners and a feeble median emargination. Eyes very large, oval, swollen-convex, protruding anteriorly as well as laterally; placed anteriorly and occupying about half of the sides of the head. Cervical border produced as a distinct, slightly reflexed collar (*O. antennatus*, *O. clarki*); bidentate (Forcl) in (*O. sexspinosus*). Ocelli well developed. Mandibles extremely reduced, even for a dacetine, just visible in dorsal view when closed; triangular, without differentiated inner margins, bluntly pointed, half or less than half as long as the distance between their apices when fully closed; insertions close to the eyes. Under-mouthparts pale yellowish, largely exposed and projecting; palpi well developed and segmented as in the worker.

Alitrunk as in the female, but pronotum unarmed; notauli complete, forming a deep Y; parapsidal furrows moderately distinct; median longitudinal carina of prescutum distinct. Propodeal teeth reduced to laterally compressed, rectangular or subacute angles, often continued ventrally as a carina on each side of the declivity. Petiole long, slender, with a distinct but very gradually rising, low convex node, unarmed at summit. Postpetiole elongate, subfusiform, convex above. Gaster long, slender, apex forming a long, blunt point and slightly arched ventrad. Genitalia (*O. antennatus*, *O. clarki*) exposed, but enfolded in the parameres; the latter seen in dorsal view broad, with convex lateral outlines and rounded apices; each with a concave mesial outline ending mesosubapically in a blunt angle, the angles of the opposite members normally opposed. Volsellae broad, very similar in the species seen. Penicilli (cerci) short and stout.

Head, alitrunk and nodes (except dorsal surfaces of last) rugulo-granulose, with scattered foveolation; dorsal surfaces of nodes feebly sculptured, weakly shining; gaster feebly sculptured if at all, weakly shining. General pilosity consisting of fine short, subadpressed or erect hairs, only moderately abundant and conspicuous. Colour largely black or blackish-brown, but the appendages and mandibles lighter, more yellowish.

Wings clear, with delicate but distinct, yellowish venation of the *Solenopsis* kind; Mf<sub>1</sub> reduced to a spur continued as an unpigmented furrow; Rs not quite reaching apical border of wing (radial cell open). Posterior wing narrow, with a broad posterior fringe of microtrichiae: broadly extended X-like venation in basocostal quadrant; four or five subapical hamuli.



DISTRIBUTION.—Of the nine species, *O. csikii* is found in Eastern New Guinea, *O. sarasini* in New Caledonia and *O. howensis* on Lord Howe Island in the Tasman Sea. The other six are confined to Australia, Tasmania and New Zealand. The species known from New Zealand, *O. antennatus*, may be a tramp there, but it is certainly native to S. E. Australia. The hardiest species, *O. clarki*, ranges from Tasmania, where it is the only known member of the genus, to S. E. Queensland, and populates medium-dry sclerophyll forest in Victoria as far west as the Otway Peninsula. Another species, *O. versicolor*, ranges south along the east coast from near Brisbane into New South Wales, and may reach the extreme eastern tip of Victoria. These three species are characteristic of the warm temperate forest regions. The three remaining species are known only from isolated patches of tropical and subtropical rain forest extending through eastern Queensland from near the New South Wales border to the Cairns-Cooktown district. *O. mjöbergi* is known from several of these patches both in the north and south, and may be found in many of them when collecting is extended. *O. sexspinosus* and *O. satan* are known only from the north.

The greatest density in distribution occurs within 150 miles of Cape Byron, New South Wales; four species are known to occur in this region. *O. howensis*, found on Lord Howe Island, only about 500 miles off Cape Byron, may well occur on the mainland. Many Lord Howe species are certainly recent introductions from the east coast of Australia. While it is possible that additional species may be found in New Guinea and the Solomons, it seems fairly safe to argue an Australasian, probably Australian, origin for *Orectognathus*, and a differentiation within its present range. *Arnoldidris* probably arose directly from *Orectognathus* in the Papuan subregion.

*Orectognathus* forms small colonies usually of less than 60 workers and one to three dealate females. The temperate forest species prefer nest sites in the soil under or beside stones, while the rain forest forms are found in rotten logs. Development, at least in the temperate areas, is slow and here sexual forms are produced during midsummer. The data, admittedly meagre, suggest that unisexuality is common in the genus.

One of the major purposes of the Australian project was the investigation of the feeding habits of *Orectognathus* and of the subtribe Epopostrumiti in order to understand better the origin and development of the interesting recently discovered habit of the widespread Strumigeniti of predation upon Collembola. It was totally unexpected that *Orectognathus* would have feeding habits similar to those of *Strumigenys* because of the disparity in size and other characteristics. Nevertheless, *O. clarki* was found to be quite definitely a collembolan predator, and the Epopostrumiti were found to have the same habit. It appears certain that Collembola form the basic diet for the three higher subtribes of Dacetini. For this reason it is desirable that the food habits of the very primitive genera *Daceton* and *Acanthognathus*, of the Neotropical area, should be ascertained.

Taxonomically, *Orectognathus* presents relatively few difficulties when the variation and polymorphism of species are properly surveyed. Due to fortunate travel opportunities, types or reliable examples of all the Australian species have been examined in Australian, English and American collections, and the extra-Australian species are regarded as distinct on the basis of published evidence.

Additional material may force revision of the status of *O. sarasini* and *O. howensis*, which are not well known. Two new species are described, but no geographical races can be recognised in the present material.

### ORECTOGNATHUS VERSICOLOR Donisthorpe.

Figures 1a, 2a, 2b.

*Orectognathus versicolor* Donisthorpe, 1940, Ann. Mag. Nat. Hist., Ser. 2, 5, pp. 46-47.

Despite Wheeler's (1927) warning that the Australian fauna contained undescribed polymorphic forms of *Orectognathus*, Donisthorpe described this species from a single worker. The description is short and contains few details not common to all species of the genus. It could apply to *O. versicolor*, *O. clarki*, and *O. mjöbergi* as delineated in this paper. Furthermore, an examination of the remains of the type in the British Museum shows that the description is partly erroneous.

The type is virtually worthless for the purpose of fixing the name to the species, since the head has been lost since 1940. Close comparison of the remains convinces me that the specimen is a small worker that could belong to either of two species as treated here, *O. versicolor* or *O. clarki*. Without the head, it is impossible to assign the name more accurately; both species occur in S. E. Queensland. Since I have a series of the dimorphic species from the type locality (Tamborine Mt., Queensland) of *O. versicolor*, and since *O. clarki* is probably rare in this region, I have arbitrarily fixed the name *versicolor* to the group to which this series belongs. I anticipate no difficulty in following this course, and if the dimorphic topotypes are considered to belong to this species by subsequent workers, much confusion will be avoided. I do not agree that the practice of creating neotypes is anything but a further source of confusion.

#### Measurements of female castes:—

Caste.	No. of Specimens.	HL.	ML.	TL.	WL.	CI.	MI.
Soldier .. ..	15	1.76-2.02	0.80-0.88	6.48-7.35	— 1.80	89-97	47-42
" Media " .. ..	3	1.60-1.66	0.83-0.84	5.80-6.16	..	88-89	53-49
Worker .. ..	29	1.03-1.53	0.66-0.82	4.53-5.75	1.02 —	79-87	64-52
Female .. ..	7	1.55-1.64	0.80-0.86	6.67-7.01	— 1.74	88-93	53-47

The relationship of head length to head width is plotted on the graph (fig. 1a). The figures and the graph show that, unless there has been a strong selection of large and small individuals in all five samples, *O. versicolor* is a strongly dimorphic

species. The "media" workers are limited arbitrarily, and the three specimens in this category are from different nests. It seems to be no coincidence that the female cephalic and mandibulo-cephalic dimensions and proportions are close to those of

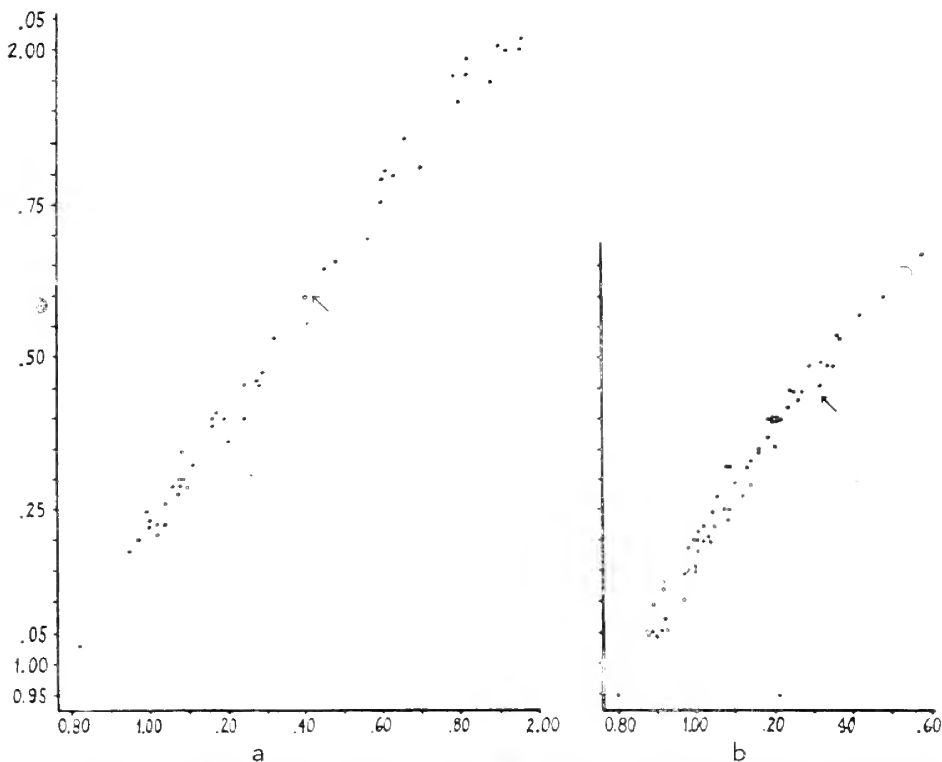


Figure 1. Graphs showing relationship of head length (ordinate) to head width (abscissae). a. *Orectognathus versicolor* Denisthorpe, based on 47 soldiers and workers from 5 nests. b. *Orectognathus clarki* sp. nov., based on 63 workers from 8 nests. The figures are measurements in millimetres. Arrows indicate approximate centres of concentration of females along curve on the basis of the same measurements.

the "medias." The largest "media" and the largest female are separated from the smallest soldier by a significant gap in HL and an apparent gap in form and proportions of the mandibles. The "medias" are probably only larger workers. This polymorphism is of a different sort from that in the closely related *O. clarki*, as a comparison of the two graphs will show. The soldier of *O. versicolor* with its huge head and massive jaws has no counterpart in any other orectognathite species.

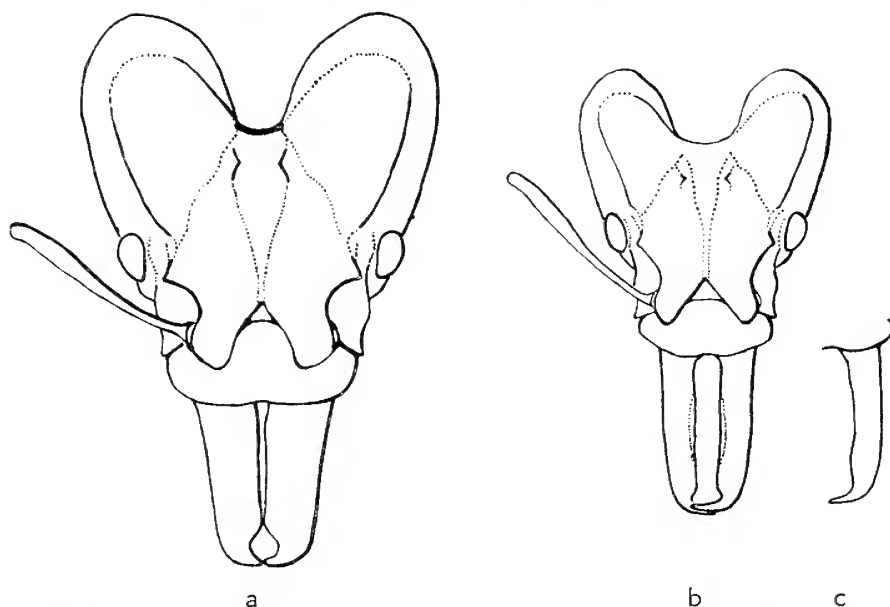


Figure 2 a-b. *Orectognathus versicolor* Donisthorpe. a. Soldier, dorsal view of head and mandibles. b. Worker (minor), dorsal view of head and mandibles.

Figure 2c. *Orectognathus clarki* sp. nov. Worker, dorsal view of left mandible.

**SOLDIER.**—Head massive, strongly modelled; the dorsal surfaces of the occipital lobes deeply concave anteriorly and centrally; the concavity bounded posteriorly and laterally by a distinct carinula. Vertex raised and convex; split longitudinally by a broad and rather deep median sulcus; posteriorly with two fine carinulae, adjacent to the sulcus and appearing like low teeth in dorsal view. Anteoocular teeth developed, rectangular or acute, more or less raised. Clypeus transverse, deeply concave, anterior border weakly emarginate in the centre. Mandibles broad and massive, up to slightly more than one-third as broad as long; apical teeth short, thick and blunt, preapical excision abrupt; remainder of inner mandibular border straight or feebly convex. Antennae slender, relatively short, failing to reach the occipital extremities by a distance equal to about one-third of their length.

Pronotum flat, anteriorly rounded, with raised margins; humeral teeth long, acute, with broad bases, flattened and with their tips bent slightly anterodorsad. Promesonotal suture absent; mesonotum suddenly and strongly elevated, the elevation consisting chiefly of two pairs of prominent blunt tubercles, of which the posterior pair (=prescutellar lobes) is longer, farther apart and more nearly dentiform. Propodeum weakly convex, lower than, and separated by a distinct metanotal suture from the mesonotum. Propodeal declivity weakly concave, subequal in length to the dorsum; propodeal teeth long and slender, about twice as long as distance between centres of their bases, straight or feebly curved and often with weakly deflected apices, diverging at an average angle of about  $40^\circ$  and elevated about  $45^\circ$  from the plane of the propodeal dorsum.

Petiole with slender, anteriorly tapering peduncle, slightly longer than the low, gradually convex node, with a low, blunt denticle on each side of the summit; posterodorsal nodal face concave. Postpetiole convex, approximately as broad as long, in dorsal view appearing truncate behind. Gaster broadly oval, compact, much narrower than head.

Head, alitrunk and both nodes with dense, distinct foveolation; the foveolae on the cephalic dorsum separated by narrow longitudinal rugulation, and with their bottoms more or less shining; those on alitrunk and nodes largely separated by narrow areas with subopaque coriaceous sculpture. Apical surfaces of occipital lobes, much of ventral surface of head, centre of pronotum, propodeal declivity and apical halves of mandibles nearly or quite smooth, shining. Basal portions of mandibles, antennae, and most of legs finely coriaceous-punctulate, feebly shining; gaster smooth and shining, sometimes with extremely short, feeble, basidorsal, longitudinal striolation.

Pilosity absent, except for a sparse vestiture of very fine, short, adpressed hairs on mandibles, antennae, legs, ventral surface of head and very indistinctly on gastric dorsum; a few long, fine, erect hairs on the ventral sides of the mandibles toward the apices and about the gastric apex. Trigger hairs of labrum fine, diverging, about two-thirds the length of the mandibles.

Colour variable, apparently subject to rapid fading in the cabinet. The freshest specimens with the dorsal surface of the head (except occipital lobes), alitrunk, nodes, and a broad transverse band across the first gastric tergite, deep blackish-mahogany, mandibles, occipital lobes and underside of head, antennae, legs and most of gaster yellowish-ferruginous.

WORKER ("media" and "minor").—Like the soldier, but smaller, more slender, and with head and mandibles like those of *O. clarki*, *O. mjobergi*. Relief of cephalic dorsum less bold than in the soldier; antecular tooth raised and distinct, rectangular or feebly acute, but usually not so acute as in the soldier. Inner mandibular border with a slight concavity filled by a very narrow, medially straight-edged and cultrate dorsal lamellate strip, approximately straight for the basal two-thirds of its length, beyond which it falls off much less abruptly to the apical teeth than in the soldier. MI increases in inverse proportion to HL and CI decreases (this is also the case with the soldiers). An increase in MI is also associated with greater narrowing of the shafts of the mandibles. The apical teeth slender, spiniform, the dorsal tooth, about twice as long as the ventral pair. Antennal scapes reaching to within about one-sixth of their lengths of the occipital extremities. Prenatal spines long and slender, length about twice the distance between the centres of their bases. Colour variable; lighter and with less contrast between light and dark areas than in the soldier.

FEMALE.—Mandibles intermediate in form and proportions between those of soldier and worker, somewhat as in *Pheidole* and other dimorphic myrmecine genera with an "intermediate" queen. Mesonotum unarmed, anteriorly with a distinct, low, median, longitudinal carina, posteriorly feebly sulcate. Scutellum convex. Mesothorax densely foveolate dorsally, with a few longitudinal costulae posteriorly on the scutum; meso- and metapleurae in large part smooth and shining. Colour as in soldiers of the same colony.

MALE.—Unknown.

DISTRIBUTION.—Holotype, Tamborine Mountain, S. E. Queensland (R. E. Turner) [BMNH]. Six additional colony-series were studied. Queensland: Tamborine Mt. (A. M. Lea); Obi Obi River, Blackall Range (W. L. Brown). New South Wales: Springwood (R. Pullen); Otford (A. M. Lea); Kiama (J. J. McCreavey); National Park (W. M. Wheeler). Deposition in [MCZ], [USNM] and all Australian collections named.

All localities are in the moist temperate areas along the eastern Australian coast. At Obi Obi River the ant was found in rain forest under a stone, and Pullen noted that the Springwood nest was under a rock in a somewhat damp situation,

so it is probable that this is the usual site preferred by the species. The series seen indicate that the colonies are rather small, with soldiers in the proportion of about one to every two workers, but it must be remembered that the soldiers represent more conspicuous objects to the collector than the workers.

The soldier and female castes are not likely to be confused with any other species, and the worker, while very similar to that of *O. clarki*, may be readily distinguished by its straight inner mandibular border.

### ORECTOGNATHUS CLARKI sp. nov.

Figures 1b, 2c.

WORKER.—Holotype: HL, 1.23; ML, 0.71; TL, 5.37; WL, 1.26; petiole, full length from dorsal view, 0.66; exposed length of antennal scape, 0.82; CI, 89; MI, 55. Paratypes (62): HL, 0.96–1.63; ML, 0.54–0.84; TL, 4.00–6.34; CI, 81–95; MI, 49–61.

Unimodally polymorphic, without division into worker and soldier castes. The workers show approximately the same range of variation in dimensions and proportions of head and mandibles as in the range worker-plus-“media” of *O. versicolor*. Largest workers sometimes with slightly larger heads than those of the accompanying females.

The workers are very similar to those of *O. versicolor* of the same size, except for slight differences in the form of the mandibles. The inner mandibular border is slightly concave in its basal two-thirds. This causes a very low, solid subapical convexity to come into relief and as the external mandibular border may be feebly convex the mandibles appear slightly arcuate.

The colour of many specimens is nearly uniformly ferrugineous throughout, with the exception of an infuscate band across the gastric dorsum present in most of them; similar to light-coloured workers of *O. versicolor*. There is a marked tendency to fade in the cabinet.

FEMALE.—Eight specimens. ML, 0.64–0.76; TL, 5.40–6.62; WL, 1.30–1.61; CI, 88–92; MI, 50–56.

Head and mandibles as in large workers of the species, otherwise similar to female of *O. versicolor*, but lighter in colour, the anterodorsal part of the alitrunk usually ferrugineous; some specimens concolorous yellowish-ferrugineous except for gastric band.

An apparent ergatoid (Wocri Yallock) has very minute underdeveloped ocelli and thoracic segments, and does not appear to have had wings. Inner mandibular borders only very feebly concave. The gaster similar to that of the worker in size, the prescutellar lobes raised, somewhat tuberculiform. Colour ferrugineous, with faint gastric band.

MALE.—HL, 0.63; TL, 4.17; head width including eyes, 0.76; WL, 1.16; forewing length, ca. 2.9.

Collar of cephalic border narrow. Mandibles extremely reduced, scarcely visible in dorsal view. Antennae more robust than in male of *O. antennatus*; third to twelfth segments two to three times as long as broad; apical segment incrassate, length (ca. 0.38) about twice that of scape, shorter than in *O. antennatus*; length of scape about twice its thickness.

Sculpture lighter than in *O. antennatus*, the foveolo-punctuation much weaker on the nodal surfaces and absent on the gastric dorsum; the latter very feebly coriaceous anteriorly, distinctly shining. Pilosity of head shorter and sparser, not so conspicuous, and not “woolly” in appearance. Colour as in *O. antennatus*; wings and volsella also very similar.



DISTRIBUTION.—Holotype, Ferntree Gully, Victoria, taken from a colony under a stone, in a patch of scrubby, grass-floored forest between Upper Ferntree Gully Station and the entrance to the public park (W. L. Brown) [Coll. Clark.] Other material was studied from eighteen nest series. Victoria: Ferntree Gully, 7 nest series (J. Clark, F. P. Spry, W. L. Brown); Summit of Mt. Dandenong, 2,000 feet (W. L. Brown); One Tree Hill, Dandenong Ranges, 1,600 feet (W. L. Brown); Airey's Inlet, Otway Peninsula (J. J. McAreavey); Millgrove (J. E. Dixon); Woori Yallock (L. B. Thorn). Tasmania: Hobart (A. M. Lea); Trevallyn (V. V. Hickman); Launceston (C. E. Cole). New South Wales: Dorrigo (W. Heron). Queensland: Toowoomba (E. J. Dumigan). Deposition of paratypes will be made in practically all the collections mentioned in the introduction.

This is the most commonly collected species of the genus, and the only one known to occur in Tasmania. The series from Dorrigo, N.S.W., consisting of twelve workers, is of interest as the only possible exception to the unimodal polymorphism usual for the species. Three of these workers, represented by the uppermost dots on the graph (fig. 1b), have broader heads than any other specimens seen. CI of these larger workers is 92–95 as against 83–88 for the nine smaller individuals; MI is respectively 54–50, and 61–55. The gap may be due to incomplete sampling of the nest, and since there is no essential structural difference in the mandibles of the large workers, they are not distinctly separated from the mass of workers on the graph, and dimorphism must be considered doubtful.

On and at the base of the Dandenong Ranges, east of Melbourne, this species was found by Mr. John Clark and myself. The nests were under or beside stones in the soil of medium-dry grassy forest dominated by stringybark and other eucalypts, with various wattles and tea-tree forming the lower strata of woody plants. The species has not been found in the adjacent damper white gum forest or wetter fern gullies in this area.

In September and October, colonies were found beneath stones, each in a single flattish chamber. One winter nest was in a crevice in a large stone which split when lifted. By January, the nests had become enlarged to three or more irregular chambers, connected by tenuous galleries, and all but one of these were several inches from the stones in the soil, often among grass roots. The upper chamber immediately beneath the stone usually contains only one or two workers and sometimes a few pupae or large larvae. On very hot, dry days, no individuals were found in this situation, indicating that withdrawal to the lower chambers is probably complete under these conditions.

In winter, nests usually contain 10–40 workers, and one or two dealate females with larvae of middle instars; summer nests contain late larvae and pupae, and at the maturation of the pupae, eggs appear and remain stuck to them in moderate numbers. Winged forms appear at the end of January and early in February; none were found after mid-February in normal seasons. Male pupae take practically the entire month of January to develop to maturity and they remain without pigmentation, other than in the compound eyes, for ten to fourteen days in an artificial nest. A

brood of workers reaches maturity slightly later than the male pupae. No female pupae or winged imagoes have been seen by either Mr. Clark or myself. Females probably are rarer than the males. In the related *O. versicolor*, I have seen two winged females in a mounted series, which lacked males. These facts suggest that the nests may be unisexual. Males are produced in small numbers; probably rarely more than eight reach maturity. In my artificial nests, male pupae were always eaten by the workers before reaching full pigmentation.

All immature stages develop very slowly both in natural and artificial nests. The eggs take at least a week to hatch. Larvae have been kept in artificial nests, starting as third and fourth instar individuals and ending as unpigmented pupae. Their development was observed for 70 days, from mid-September to early December, and was so slow that it is hard to see how more than one or two broods can be raised in a year in Victoria.

When a nest is opened, the ants move in typically slow and deliberate dacetine fashion, and some individuals curl up and feign death briefly. In spite of the slow pace of the workers, the brood is carried to safer quarters with considerable despatch and efficiency. The larvae and pupae are held by the ends of the jaws, and the basal teeth never seem to be engaged for this purpose. Some of the workers retreat threateningly or stand their ground with jaws open at more than  $180^{\circ}$ . When closed sharply, the jaws come together with a distinct click. As in all other dacetines studied, retrosalience occasionally occurs as the closing mandibles strike some unyielding surface, but this appears to be accidental. In spite of the threatening attitude, *O. clarki* is a timid insect. The sting does not penetrate the skin of the fingers, and it is not known whether the ants really try to employ it when handled.

Although several nests were carefully searched, no sign of prey was found, but this was probably due to the confused structural situation accompanying the opening of the nests. In one nest, a purposely introduced entomobryid collembolan of large size was snapped at by one worker in the midst of the confusion, but an aphid and a symphylan caused the ants to recoil on contact.

When placed in a glass-topped plaster nest, the ants quickly assembled in part of one chamber and gathered the brood there. The queens tended to remain close to the brood, but wandered on rare occasions, usually when alarmed. Often one worker would crouch quietly with head low, apart from the rest and near or facing the passage leading from the brood chamber. This habit, of a single worker apparently acting as a sentinel, has also been observed in other dacetine genera.

Various small terrestrial arthropods were introduced to parts of the artificial nests, and it soon became apparent that the species was a collembolan feeder. Its attacks on the Collembola appeared calculated and efficient compared with those of Nearctic species of *Smithistruma*. A wide variety of other arthropods were not accepted as food, whether living or dead. Small myriapods, campodeids and spiders caused the ants to recoil violently, while various free living and parasitic mites and

thrips were ignored. Arthropod carcasses were carried as far away from the brood as possible, often to a midden area which also received dead ants and other nest refuse. Among the Collembola offered, Poduroidea were ignored. Only Entomobryoidea were accepted, and among these, Entomobryidae were preferred to Isotomidae. Thus the same prey selectivity of *Strumigenys* and other dacetines (Wilson, 1950; Brown, 1950) occurs in the present species, and also in epopostrumites investigated. This narrow preference is somewhat surprising, and the reason for it is unknown. Entomobryoidea taken by the ants have not been identified beyond the family because of the special apparatus and techniques required.

In stalking, the ants approach the victim only after it has come within 5–10 mm.; often the collembolan runs off and is not caught until several attacks, often by several ants, have been made. Most of the collembolans caught were of very small size compared with the workers of *O. clarki* with their large mandibles, but nevertheless, many struggled for several minutes after being heavily struck. In such cases, the ants usually resorted to their stings, but even this action often did not immediately subdue the springtails. The lingering struggles of the prey are in marked contrast to the rapid cessation of movement in similar collembolan species caught by *Strumigenys perplexa* (Fred. Smith). As soon as the presence of a victim is noticed, the ant turns toward it and immediately assumes a threatening attitude with mandibles open to the utmost. The strike is extremely rapid, and the ant seems neither to lunge forward nor pull backwards in accompaniment. The collembolan is held fast in the tips of the jaws until it ceases struggling or is released for another strike.

In feeding, the workers malaxated the prey and lapped up the juices exuding from the wounds. Usually only one worker would feed from a carcass although other workers might approach and evince what seemed to be rather mild interest, then leave. A feeding worker usually brought the carcass fairly near to the brood. In many hours of watching in full light no prey was seen to be placed very near the larvae which were not observed to feed in the artificial nest. The workers were frequently seen licking the larvae, including the oral region, but high magnification of the proceedings revealed no trophallactic exchange. This state of affairs is probably due to the unnatural surroundings, or too much light. However, larvae of other genera in the tribe were fed directly in the light in artificial nests. It is not impossible that the primitive dacetines practice trophallaxis and that direct feeding is secondary. This can be settled only by further observation.

A queen of *O. clarki* when introduced into an alien nest was accepted without unusual display. She remained near the brood and other queen and behaved like an original inhabitant during the 22 days that the nest was observed. Alien workers of the same species, however, were not accepted without a prolonged struggle, which took the form of a tug-of-war between pairs of individuals, alien and inmate. Sometimes the interlopers died from wounds received, but others were gradually accepted. In fighting, the favourite grip is one with the mandibles fastened to the opponent's postpetiole.

The larvae are very plump in the last two instars. Very little movement is noticed in them except in the mandibles. Observations on this ant will continue when fresh material is secured.

### ORECTOGNATHUS MJÖBERGI Forel.

*Orectognathus mjobergi* Forel, 1915, Ark. f. Zool., 9, 16, pp. 38-39, pl. 2, figs. 3, 4.

*Orectognathus mjobergi* var. *unicolor* Forel, 1915, Ibidem, p. 39.

WORKER.—16 specimens, HL, 1.25-1.48; ML, 0.75-0.82; TL, 5.34-6.33; WL, 1.25-1.47; CI, 75-80; MI, 55-63.

FEMALE.—Probable type of var. *unicolor*, HL, 1.42; ML, 0.90; TL, 6.36; WL, 1.70; CI, 70; MI, 64. Specimen taken with workers, Tamborine Mt., HL, 1.62; ML, 0.97; TL, 7.31; WL, 1.92; CI, 80; MI, 60.

In general form and armature, this species is intermediate between *O. clarki* and *O. antennatus*. The mandibles are shorter than in *O. antennatus*; the narrow lamella of the inner mandibular border is present, but is approximately the same width throughout to near the base; the subapical portion, if convex, is only feebly so and does not form a distinct flange or low lobe as in *O. antennatus*. The head is narrower than in most specimens of *O. clarki*, and there is no evidence of polymorphism among the workers. The antecular tooth is low, obtuse and inconspicuous. First gastric tergite with a broad basal zone very finely striate-reticulate, subopaque or weakly shining. Colour deep ferrugineous-brownish, with the gaster concolorous or with a deep reddish-yellow hue. In the workers the spaces between the foveolae on the head and alitrunk and the bottoms of the foveolae themselves are for the most part finely granulose and opaque, but in the females this fine sculpture is mostly absent on the head and the interfoveolar spaces are weakly shining.

DISTRIBUTION.—The type locality is Cedar Creek, near Ravenshoe, N. E. Queensland (E. Mjöberg). The type has not been seen: probably deposited in Coll. Forel or Coll. Mjöberg. The type locality of the suppressed var. *unicolor* is Malanda, Queensland (E. Mjöberg) [Coll. Clark\*]. Other material studied from: Tamborine Mountain, S. E. Queensland (A. M. Lea); Malanda, N. E. Queensland (G. F. Hill); and Kuranda, N. E. Queensland (F. P. Dodd). Deposition in [MCZ], [Coll. Clark], and [SAM].

Mjöberg took this species in rotten wood. All localities are in rain forest areas, the first in the extreme south-east and the others in the north-east of the State. It is possible that the species is widely distributed in intermediate patches of rain forest.

The female from Malanda seems to be the type of Forel's var. *unicolor*, a form which was proposed in so obscure a fashion that Emery (1922) overlooked it in his listing. A comparison of this specimen and workers from the same locality with a female and workers belonging to *O. mjobergi* forces suppression of the varietal name. When the variability of the caste in allied species is taken into account, the disparity in dimensions and proportions between the two females is not excessive.

The coloration of the workers varies somewhat from colony to colony.

**ORECTOGNATHUS ANTENNATUS** Fred. Smith.

*Orectognathus antennatus* Fred. Smith, 1853, Trans. Ento. Soc. Lond., (Ser. 2), 2, p. 228, pl. 21, fig. 9.

*Orectognathus antennatus* var. *septentrionalis* Forel, 1910, Rev. Suis. Zool., 18, p. 51.

WORKER.—Ten specimens taken from five colonies at the localities cited, HL, 1.35–1.64; ML, 0.79–1.00; TL, 5.58–6.74; WL, 1.40–1.70; CI, 76–80; MI, 57–62.

FEMALE.—Two specimens from two colonies from New Zealand, HL, 1.58–1.59; ML, 0.91; TL, 6.98–7.03; WL, 1.81–1.83; CI, 81–82; MI, 57–59. Holotype of var. *septentrionalis*, HL, 1.62; ML, 1.00; TL, 7.30; WL, 1.82; CI, 87; MI, 62.

This species may be distinguished by the slender head and mandibles, by the absence of antecular teeth, which are replaced by slight convexities, and by the distinct, rounded, lobe-like subapical broadening of the feebly sinuous, narrow lamella on the inner mandibular border. Humeral teeth short, not longer than their width at base. Anterior mesonotal tubercles in the form of low welts; posterior tubercles larger, erect, more or less acute. In worker, teeth of petiolar node obsolete, clearly seen only in dorsal view; in female, these teeth larger, distinct and acute. Interfoveolar spaces of head, centre of pronotum nearly smooth, shining; gaster smooth, shining. Pilosity reduced as in *O. versicolor* and *O. clarki*. Colour varying from yellowish to medium ferruginous, the vertex, nodes, and middle of gastric dorsum weakly infuscated in darker specimens. Female usually darker than accompanying workers; alitrunk often weakly infuscated.

MALE.—(From Waikino, New Zealand), HL, 0.87; TL, 5.4; head width including eyes, 0.96; WL, 1.72.

Mandibles very slightly larger and cervical collar more pronounced than in male of *O. clarki*. Antennae slender, third to twelfth segments three to four times as long as broad; apical segment (length ca. 0.45) over twice as long as scape. Sculpture more pronounced than in male of *O. clarki*; nodes and first gastric tergite coriaceous, sparsely foveolo-punctate, faintly shining. Pilosity of head whitish, more abundant and conspicuous than in male of *O. clarki* and with a slightly woolly appearance. Colour black, nodes and gaster blackish-brown; mandibles, legs and genitalia ferruginous-yellow; antennae ferrugineous.

DISTRIBUTION.—The type locality is New Zealand [BMNH]. The locality for the type of the suppressed variety *septentrionalis*, a dealate female, is Wollongbar, Richmond River, New South Wales (W. W. Froggatt) [Coll. Clark]. Other material from the following localities:—New Zealand: Without precise locality, one dealate female (Swezey); Waikino, Auckland, three workers, one dealate female and one male; Titirangi, two workers (E. S. Gourlay). New South Wales: Dorrigo, two workers (W. M. Wheeler); Salisbury, one worker (P. J. Darlington). Victoria: Millgrove, two workers (J. E. Dixon). Deposition in [MCZ] and [Coll. Clark].

This ant has been collected in abundance only in N. E. New South Wales and in New Zealand around Auckland. I suspect it is an importation into the latter region. The locality in Victoria is surprising in view of the concentration of the localities in New South Wales.



Forel's separation of a variety, based on a single female, is not borne out by comparison of the specimen with Australian and New Zealand material. The variation in female head width is similar to that observed in *O. versicolor*, *O. clarki* and *O. mjobergi*. New Zealand workers have on the average shorter mandibles than those of Australian specimens, but this difference is not significant when possible error of measurement and the small size of the samples are considered. There is no difference in colour.

**ORECTOGNATHUS HOWENSIS** Wheeler.

*Orectognathus antennatus* var. *howensis* Wheeler, 1927, Proc. Amer. Acad. Arts Sci., 62, pp. 145-146, fig. 7.

Wheeler described this form from a single worker collected by A. M. Lea on Lord Howe Island. The specimen [SAM] has unfortunately lost the head since description, and no further material has been collected.

Wheeler's characterization and figure indicate that specific status is warranted. The lamella of the inner mandibular border is expanded subapically as a low, subacutely-pointed toothlike process, and not as a rounded lobe as in *O. antennatus*. A somewhat similar process is described and figured by Szabó (1926) for *O. csikii*. Otherwise *O. howensis* seems to be very similar to *O. antennatus*. Wheeler's measurement of length (5mm.) seems too low. The possibility exists that this species has been carried as a tramp from Australia or New Guinea.

**ORECTOGNATHUS CSIKII** Szabó.

*Orectognathus csikii* Szabó, 1926, Ann. Mus. Nat. Hung., 24, pp. 350-351, figs. A, a.

DISTRIBUTION.—The type locality is Erima, Astrolabe Bay, New Guinea (Biró, 1897), [MNH]. An additional New Guinea locality is Marega (L. Biró, 1901), found in rotten wood.

As indicated in Szabó's figures, the ant is similar in habitus to small workers of *O. versicolor* or *O. mjobergi*, with estimated CI ca. 88 and MI ca. 74. Mandibles slender, each with a low, subacutely-pointed toothlike process or lamella on the subapical portion of the inner mandibular border. Antecular teeth small, more or less acute; a small raised pair of teeth on the vertex. Humeral teeth large, flattened-subspiniform and acute at the tips, similar to those of *O. mjobergi*. Mesonotum raised slightly above the pronotum; the anterior mesonotal welts indistinct or absent, but posterior pair well developed, acute. Petiolar node with a well developed pair of teeth.

The species has not been reported since the time of its description.

**ORECTOGNATHUS SARASINI** Emery.

*Orectognathus sarasini* Emery, 1917, in Sarasin and Roux, Nova Caledonia, Zoologie, 1, (4), pp. 416-417.

*Orectognathus antennatus* var. *sarasini* Wheeler, 1927, Proc. Amer. Acad. Arts Sci., 62, pp. 125, 146.

DISTRIBUTION.—Known only from the type locality—Mt. Canala, 650 M., New Caledonia. Part of the type series probably is deposited in Coll. Emery.



Emery (1914) stated specimens of *O. sarasini* smaller than *O. antennatus* ("L. with mandibles 4.2-4.6 mm."), with similar but more slender mandibles. In the original description of *O. mjobergi*, Forel stated that the species was "much larger than *sarasini*," but gave the length with mandibles of the *O. mjobergi* worker as only 4.4-4.6 mm. This gives some indication of the difficulty of interpretation of measurements made by former authors.

As additional characters distinguishing the species from *O. antennatus*, Emery cites the more acute and prominently projecting anterior mesonotal tubercles; the longer, more slender propodeal spines; the small indistinct denticles of the petiolar summit, and the sculpture which is "much more feeble, the punctures more widely spaced, so that the insect is much more shining." The dorsal surface of the propodeum is polished, with some well-spaced umbilicate punctures; petiole and postpetiole superficially reticulate.

The species must be regarded on the published evidence as distinct from *O. antennatus*. Wheeler never handled any New Caledonia specimens of the genus.

#### **ORECTOGNATHUS SEXSPINOSUS** Forel.

*Orectognathus sexspinus* Forel, 1915, Ark. f. Zool., 9, 16, pp. 39-41, Pl. 2, figs. 1, 2.

WORKER.—One cotype, HL, 1.17; ML, 0.85; TL, 5.15; WL, 1.24; CI, 74; MI, 73.

This species is very distinct from its congeners. The body is extremely slender, especially the petiole and mandibles. Antecular teeth acute but small. Inner mandibular border feebly convex near the basal third and again before the apex. Dorsal apical tooth about three times as long as the ventral fork and relatively more slender. The antennal scapes reach the occipital extremities. Humeral teeth longer than in any other species, slender and spiniform, anteriorly curved. Anterior mesonotal tubercles obsolete, posterior mesonotal tubercles erect, acutely spiniform. Petiole exceedingly elongate, with a very narrow, low, dorsally convex node with no trace of denticles on the summit. Body smooth and shining, the widely scattered foveolae small and few. Body and appendages with abundant delicate short erect hairs, evenly distributed. Colour, bright ferrugineous-yellow with whitish legs and mandibles; the femora and tibiae infuscated next to the articulations.

MALE.—Distinguished by the pilosity, similar to that of the worker, and by the short scape, "scarcely  $1\frac{1}{2}$  times longer than thick." Wing venation and genitalia unknown.

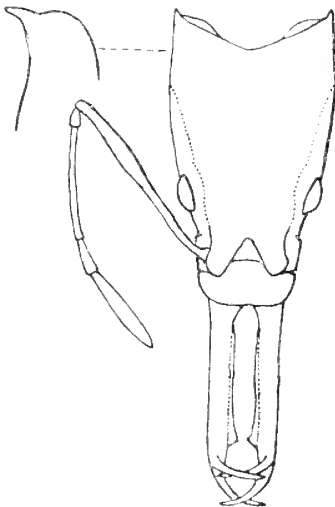
DISTRIBUTION.—Known only from the type series from Cedar Creek, near Ravenshoe, N. E. Queensland (E. Mjöberg). Deposition [Coll. Forel], [Coll. Mjöberg], one cotype [Coll. Clark\*]. The ant was taken in rotten wood in rain forest.

**ORECTOGNATHUS SATAN** sp. nov.

Figure 3.

WORKER.—Holotype, HL, 1.48 ; ML, 0.98 ; TL, 6.19 ; WL, 1.60 ; CI, 61 ; MI, 66 ; antennal scape 1.00 ; distal segments 0.12, 0.60, 0.20, 0.49 (total 1.41).

Head very long, narrow, narrowing slightly anteriorly ; width of clypeus about three-fifths that across occipital lobes. Vertex raised, convex, with two very feeble subsulciform impressions, one running transversely from eye to eye, the other posteromedian and longitudinal. Posterodorsal margins of occipital lobes each produced as a stout acute, dorsally-curved tooth. Occipital excision deep ; entire occiput depressed ; dorsum of the occipital lobes weakly concave. Sides of head anterior to eyes feebly concave ; frontal area very small, impressed ; clypeus impressed antero-medially and with a feeble median emargination of its anterior border. Frontal carinae weak, only feebly convex in the antecocular position, becoming obsolescent dorsally and posteriorly to eyes. Antennal scrobes very feebly indicated, especially behind eyes. Eyes long-oval, convex, 0.24mm. in greatest diameter, situated on ventral limits of scrobes with their posterior borders slightly anterior to mid-length of head.

Figure 3. *Orectognathus satan* sp. nov.

Worker, dorsal view of head and mandibles and (inset) lateral view of left occipital region.

Mandibles straight and slender ; inner margins nearly straight, very narrow, lamelliform, expanded gradually apicad, forming a blunt toothlike process bounded by a preapical excision. Apical teeth slender, curved, spiniform, the separate dorsal tooth 0.24mm., dorsalmost of ventral pair 0.19mm., ventralmost 0.11mm. long. Antennae very slender ; scapes feebly sigmoidal, slightly fusiform-increassate in apical half, failing to reach the apices of occipital teeth by about one-fifth their own length. Funiculus slender ; the pedicel slightly thickened ; the second segment slender, feebly curved ; apical segment increassate.

Pronotum flat, submarginate, with low, subrectangular humeral teeth. Mesonotum gently elevated, with four low, rounded tumuli, the anterior pair slightly the more prominent. Metanotal groove deeply impressed, partly bridged by short longitudinal costulae in the bottom. Propodeal dorsum longer than broad, transversely convex ; longitudinally, only slightly convex anteriorly. Propodeal spines extremely long, slender, acute, elevated at an approximate angle of 45°, diverging at an angle of 55° ; extremely feebly curved mesad, tips feebly deflected ventrad ; 0.74mm. long

from centres of longitudinally costulate bases; distance between centres of bases 0.18mm. Propodeal declivity feebly concave, bordered ventrolaterally by a round translucent flange. Bulla of metapleural gland with carinula shaped posteriorly like a reversed L.

Petiole very long, slender (0.80mm. in dorsal view), gradually rising and thickening posteriorly; node consisting almost entirely of two heavy, subconical, posteriorly-directed dorso-lateral teeth. Postpetiole bun-shaped, much broader than the petiolar node, slightly broader than long, greatest width 0.38mm., slightly narrowed posteriorly. Gaster as usual for the genus. Legs long, slender; femora incrassate in distal halves.

Head and alitrunk covered with small foveolae; the intervening spaces narrow, forming oblique costulae on the dorsal surfaces of the occipital lobes. Other interfoveolar spaces, afoveolate median patches on the posterior vertex, anterior pronotum, anterior propodeal dorsum, petiole, coxae, legs and bases of mandibles coriaceous, subopaque to moderately shining. Dorsum of postpetiole nearly smooth, shining. Mandibles and antennae feebly punctate, shining, the latter only weakly so; sides of alitrunk irregularly and coarsely punctate-rugulose, with limited shining areas; gaster and propodeal declivity smooth, shining; clypeus and much of petiolar node finely coriaceous, opaque, with scattered feeble foveolae.

Inner ventral mandibular surfaces and gastric apex with a few fine erect hairs; antennae, legs, gastric apex and underside of head, with very fine, short, sparsely distributed, adpressed pubescence. Trigger hairs of labrum short, slightly longer than the width of a mandible, strongly diverging.

Colour, including that of coxae, rich reddish-ferruginous, with occipital lobes slightly lighter and gaster slightly darker. Prothoracic legs pale straw-coloured with light ferruginous articulations; other legs and antennae yellowish-ferruginous.

Measurements of the eight paratypes, HL, 1.41–1.52; ML, 0.94–1.00; TL, 5.75–6.37; WL, 1.46–1.61; CI, 58–61; MI, 66–67. Very similar to the holotype; the propodeal spines of several specimens are quite straight viewed from above; angle of spinal divergence 50°–60°.

FEMALE.—Dealate, HL, 1.52; ML, 0.98; TL, 6.47; WL, 1.62; CI, 62; MI, 65.

Like the worker; with the usual sexual differences, weak compared to those in other species of the genus. Pronotum shallowly impressed in middle. Mesonotum rather weakly developed, with broad longitudinal sulcus; anterior tumuli distinct, posterior pair (prescutellar lobes) developed as small, erect rounded flanges above the wing insertions; scutellum depressed, nearly flat. Wing stumps black; ocelli small but distinct. Postpetiole with dorsal foveolae more distinct than in the worker; gaster slightly larger, mahogany in colour.

DISTRIBUTION.—Malanda Falls, Malanda, N. E. Queensland, at 2,400 feet, W. L. Brown, 8th November, 1950. Deposition, holotype and female [MCZ], paratypes [Coll. Clark], [MCZ], [SAM], [QM.], [Coll. McAreavey], [USNM].

These 10 individuals were found huddled, practically motionless, with a few larvae in a small, elongate cell (about 25 x 7 x 7mm.) in the heart of a large, moist, rotten log lying on the floor of the rain forest near the creek. A narrow passage about 25mm. long led obliquely downward from the end of the inhabited cell to a shorter uninhabited cell with clean floor and walls. No other chambers were seen, but small crevices connected the second cell with anastomosing cavities made by borers and other insects. The cells contained no remains of prey. Apparently the ants were in a state of aestivation, a very thorough search of the log revealing no other workers. When disturbed, some ants moved very slowly away with larvae, while others remained still. This species may prey on the medium-sized *Paronellides* and similar long-antennate entomobryids which are found in rotten logs in the Queensland rain forests.

Superficially this species seems to be closely related to *Arnoldidris horvathi* (Szabó) because of the dentate occipital lobes and the very long propodeal spines. However, the form of the pronotum and mesonotum, the petiole and postpetiole, the subapical mandibular process, and the sculpture point to placement in *Orectognathus*. Apparently the closest species is *O. antennatus*, but it differs markedly from this and other species of the genus in the form of the head and in numerous other features. The head shape and somewhat reduced humeral teeth may be indications that *O. satan* is close to the stock which gave rise to *Arnoldidris*, or alternatively the similarity of the heads of *O. satan* and *A. horvathi* may be due to convergence.

KEY TO THE SPECIES OF *ORECTOGNATHUS*, BASED ON THE WORKERS.

1. Each occipital lobe posteriorly produced as a stout, acute, dorsally-curving tooth ..... *satan*, new species  
Occipital lobes bluntly rounded posteriorly, without teeth ..... 2
2. Propodeal spines about three times as long as the distance between the centres of their bases ;  
body and limbs with abundant and generally-distributed fine, short erect pilosity ;  
petiolar node very slender, unarmed.....*sexspinosus* Forel  
Propodeal spines decidedly less than three times as long as the distance between the centres  
of their bases ; without generally-distributed erect pilosity or else the petiolar node  
bidentate, or both.....3
3. Inner mandibular border with a low, subacutely pointed tooth or lamella just basad of the  
apical fork ..... 4  
Inner mandibular border without subapical armature or else with a low rounded subapical  
flange or convexity..... 5
4. Small bilaterally-paired acute teeth present in front of eyes on vertex, and on summit of petiolar  
node ; with generally distributed erect pilosity.....*csikii* Szabó  
Anteocular teeth and teeth of vertex obsolete ; petiolar teeth nearly so ; erect hairs confined  
to mandibles and gastric apex.....*howensis* Wheeler
5. Monomorphic ; anteocular teeth very low and obtuse or altogether lacking ; head narrower,  
CI, 75-80..... 6  
Polymorphic ; anteocular teeth present, usually strong, rectangular or acute ; head broader,  
CI, 79-97, rarely under 81..... 7
6. Lamellate margin of inner mandibular border with a strong, rounded subapical expansion ;  
anteocular teeth each represented only by a slight convexity.....*antennatus* F. Smith  
Lamellate margin of inner mandibular border narrow throughout, not or scarcely expanded  
subapically ; anteocular teeth present, obtuse.....*mjöbergi* Forel
7. Inner mandibular borders approximately straight along basal two-thirds ; dimorphic, with  
large-headed, broad-jawed soldier caste as well as "normal" workers  
..... *versicolor* Donisthorpe  
Inner mandibular borders shallowly but distinctly concave along basal two-thirds ; unimodally  
polymorphic, without distinct soldier caste having different mandibles  
..... *clarki* sp. nov.  
*O. sarasini* Emery is not included in this key owing to insufficient knowledge of its  
characteristics.

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## A STONE IMPLEMENT FROM NORTH-EAST QUEENSLAND.

GEORGE MACK.

Queensland Museum.

A third example of an uncommon Aboriginal stone implement was added to the collections of the Queensland Museum in 1948 by Mr. C. E. Mittelheuser. The specimen was turned up by the plough in land that was being prepared for an extension of sugar cane growing at Pawngilly, near Babinda, north-east Queensland. It would appear to be the tenth of its kind known in Australian collections.

The implement is made from a highly metamorphosed volcanic rock. It is 130 mm. high, and the base measures 121 mm. in length by 13 mm. in thickness. The grip is fashioned at a slight angle to the base which is both polished and striated. The prominent marks on the hand-grip (Figure 1) were caused by the plough.

This type of implement was first described by Casey (1936) who referred to four examples: two in the National Museum, Melbourne, one in the Australian Museum, Sydney, and one in the Queensland Museum, Brisbane. McCarthy (1944) has since recorded a total of three for the Australian Museum, and there are now three in the Queensland Museum.

Casey stated that the use to which these artefacts were put was unknown, but he quoted from an old label in the Queensland Museum which described them as "whetstones," used by the Aborigines to sharpen tomahawks and to strip netted fibre. As a reason for the fashioning of such a finely made tool, this explanation is not convincing. Much more likely is the explanation given by Kennedy (1949) when he recorded two of these specialised implements in his own collection. He stated that an old resident of north-east Queensland informed him that the Aborigines used them especially for smoothing or finishing their large wooden implements, such as the large swords which were characteristic of the district. With wet sand as an abrasive, the stone implement was moved over the surface of the wood until the required degree of smoothness was attained. This is a convincing explanation, and it affords an equally convincing explanation of the polished and striated base of the stone implement. It is noteworthy that the large swords mentioned, which were made from hardwood, as well as large shields of softwood, and these uncommon stone implements have all been obtained only in the Cairns-Cardwell rain forest area of north-east Queensland.

It has been stated by McCarthy that examples of this implement were presented by Mr. G. Kimlin to the Museums in Brisbane, Sydney and Melbourne. This is incorrect. Following are the localities and names of donors of these artefacts in the Queensland Museum:—

Johnstone River, North-east Queensland. Presented by H. Tryon, 2-12-1897.

Midgenoo, Tully River, North-east Queensland. Presented by A. B. Shardon, 7-4-1936.

Pawngilly, near Babinda, North-east Queensland. Presented by C. E. Mittelheuser, 31-10-1948.



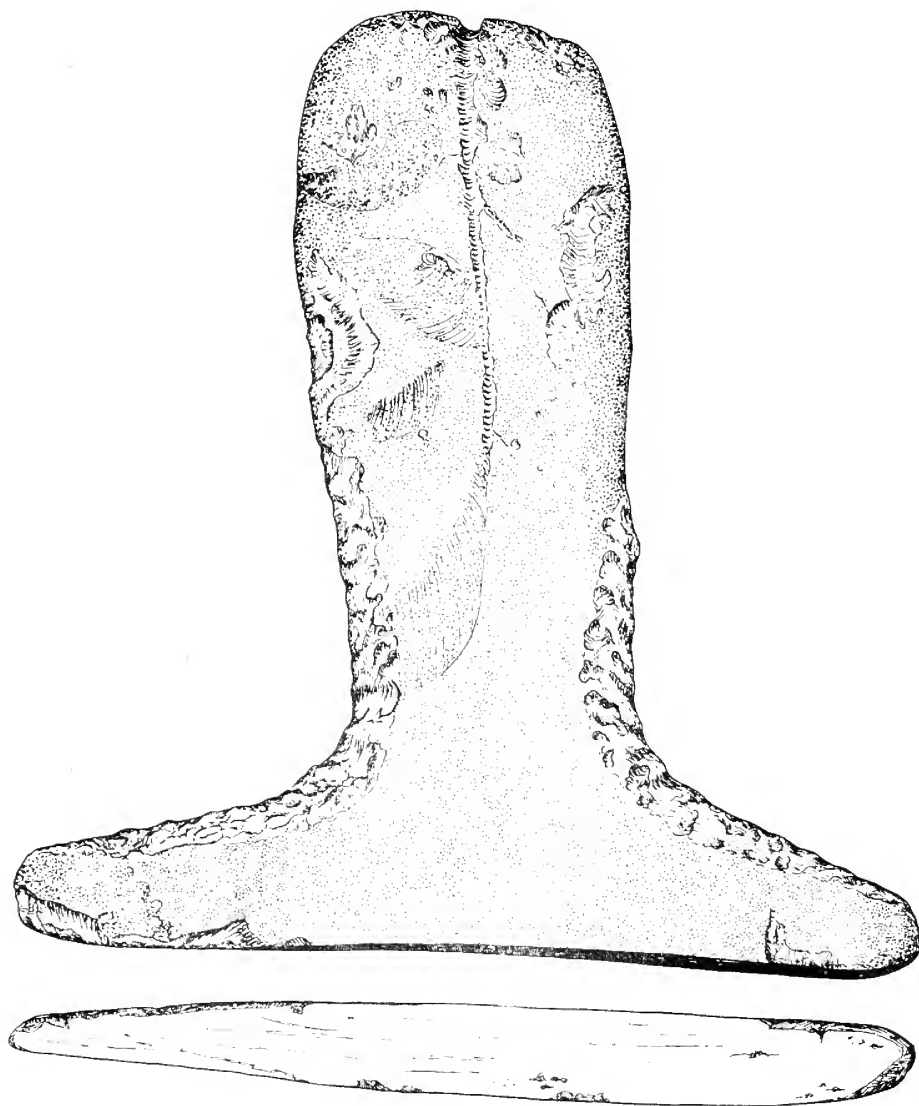


Figure 1. Stone Implement from Pawagilly, North-east Queensland.

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